



FRIDAY, MAY 3, 1901.

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Contributions

Electric Traction for Heavy Railroad Service.

Northern Pacific Railway Company,
St. Paul, Minn., April 26, 1901.)

TO THE EDITOR OF THE RAILROAD GAZETTE.

In your report of the discussion of Mr. Burch's paper on "Electric Traction for Heavy Railroad Service," at the March meeting of the Northwest Railway Club, certain remarks which I contributed but of which I was not the author are ascribed to me. The official proceedings of the club clearly show that my contribution was an abstract of a paper read before the American Society of Civil Engineers by Mr. C. H. Davis. Will you kindly publish this disclaimer in your columns?

G. H. GOODSELL.

[That part of the discussion which we reprinted as from Mr. Goodsell was not included in quotation marks, and we therefore supposed that the words and opinions were his. Our fault, if any, was in not looking back in the *Transactions* of the American Society of Civil Engineers to verify the quotations, which might seem an excess of care even for the EDITOR.]

Internal Friction of Locomotives.

Chicago & Northwestern Railway Co.,
Chicago, April 16, 1901.)

TO THE EDITOR OF THE RAILROAD GAZETTE.

I was much interested in your discussion of the locomotive friction question on page 254 of the April 12 number of the *Railroad Gazette*. The question of engine friction has been very much talked about and has been looked at in a number of different lights, and the statements of the percentage of efficiency back of the drawbar have been very wild and delusive.

We think that the most logical way to treat this is to consider the internal friction of the engine due to the conditions which actually constitute the motive power of the locomotive itself; that is, the eccentrics, link motion, pistons, cross-heads, rods, etc., and to consider the rolling friction and the effect of gravity on a grade due to the same causes as would act upon a train, and causing a pull more or less powerful to move the train.

Some recent experiments which were made on the Chicago & Northwestern Railway with the standard freight locomotive of that road with cylinders 20 x 26, carrying 190 lbs. steam pressure, having 63-in. driving wheels and weighing 130 tons in working order with engine and tender, developed the fact that the internal friction referred to above averaged about 8 per cent. with the reverse lever in the corner, or cutting off at 90 per cent. of the stroke. This was increased to about 18 per cent. when the cut off was at 10 per cent. of the stroke. These results were demonstrated as follows, in connection with the dynamometer car and indicator diagrams which were taken on the locomotive at the same time: From these diagrams the indicated tractive power was deduced. The record on the dynamometer car gave the pull

existing at the drawbar at the time when the indicator diagrams were taken. To this drawbar pull was added the effect of the grade and the effect of speed resistance upon the engine and tender, considering them as part of the train of 130 tons weight. In other words, the drawbar pull was added to resistance which had been required to pull the engine and tender on the same grade and at the same speed with the rods and links disconnected, this being figured on the same basis as the regular train resistance. Where momentum grades existed, the proper allowance was made so as to reduce them to an equivalent uniform grade. If we assume (as seems to be near the truth) that 5 per cent. of the steam pressure will be lost by transmission from the boiler to the cylinders, and that the mean effective pressure at 90 per cent. cut off will be 91 per cent. of the initial pressure, we have an allowance of 8 per cent. for internal friction and maximum available tractive force at the circumference of the drivers of $0.8 \text{ pd}^2 + D$. This, we can depend upon as giving the maximum tractive force which can be obtained from the engine under general working conditions.

In figuring on the amount of load which the engine can pull, we must, of course, include the weight of the engine and tender as so many tons of train, as the tractive force above given is that exerted at the circumference of the drivers.

Actual experiments with the dynamometer car on the Northwestern road indicate that this can be relied upon in actual service, as in fact in all the cases tested where the tractive force at the circumference of the drivers amounted to 25,000, which was the maximum available tractive force figured out on the basis of the above formula, there was little trouble in the engine doing the work, and where the engine stalled the sum of the drawbar pull (as indicated by the dynamometer car) plus the resistance of the engine and tender, due to the grade and speed gave a greater value than the 25,000 lbs.

Under these circumstances we feel that it can be pretty generally assumed that the formula above given will indicate the maximum tractive power of the engine at the circumference of the drivers, and the percentage of energy exerted back of the drawbar depends of course upon the grade and the speed taken in connection with the engine and tender, as this resistance will vary continually with the profile of the road upon which it is worked.

G. R. HENDERSON.

First Aid to the Injured on the Lackawanna.

Lackawanna Railroad,
Y. M. C. A.,
Hoboken, N. J., April 29, 1901.)

TO THE EDITOR OF THE RAILROAD GAZETTE.

I have read the interesting article in your issue of April 26 on what is being done by the railroads of the country to ameliorate the condition of employees and others who may be accidentally injured at stations or on trains; and as the Lackawanna lines have been the scene of some of the best work that has been done in this direction I venture to give you a few facts on the subject.

Systematic first aid instruction is of comparatively recent origin. A great deal has been done in the last few years, but there still remains a great deal more to do. It would seem that the railroads would be the first to welcome this kind of work among their employees, and experience has shown that they are willing to have it done, where the subject is properly brought to the attention of the railroad officials. In some instances the subject has been brought to the attention of the railroad companies through the instrumentality of the Railroad Department of the Young Men's Christian Association, and such is notably the case on the Lackawanna.

The work on this line was first started in the railroad Y. M. C. A. at Elmira, where a complete emergency hospital was put into the association building, and emergency boxes were placed at convenient points along the Buffalo Division. From Elmira the work spread to Scranton and Hoboken, and the Hoboken association not only prosecuted the work on the plan already laid down, but through an efficient committee it introduced new features.

We secured a doctor from the Society for First Aid in New York State, who gave free instruction to a large class of railroad men, the class using the text-books furnished by the New York State Society. This instruction consists of a series of six lectures, followed by an examination, those passing receiving a diploma from the First Aid Society before referred to. This course of lectures is exceedingly simple, including elementary anatomy, bandaging, and the emergency treatment of cases of sudden sickness or injury. Since 1896 we have graduated between 50 and 60 men who are more or less proficient in this kind of work.

The company made for the Association 25 boxes, and the Association furnished the material contained in them; and these boxes were placed at all the important points in the Hoboken yard, and along the Morris & Essex Division, as far as Phillipsburgh. Small, portable boxes are used on the trains, and as fast as one of a train crew passes the required examination a box is placed on the train, not only for the use of the train crew, but also for the use of the passengers in case of need. About three years ago the First Aid Committee of our Association raised \$500 with which to equip an emergency hospital in the rooms of the Association at Hoboken. This room is equipped with a cot bed, an operating table, a portable bath tub, a complete set of surgical instruments and sick room furniture; also medicines and appliances for 50

cases of injury or sickness. We also have stretchers at all junction points and terminals.

The life of many a man has been saved by this emergency corps since its inception, and the boxes have not only proved a balm for the minor ills to which railroad flesh is heir, but they have restored hope to the faint hearts of friends when the life of the victim has trembled in the balance. In the good old times of gross ignorance of first aid methods it was the usual thing to prop up the patient in a sitting posture, dose him with whisky, then crowd around him, excluding the air, and, in a loud voice, comment on his chances of recovery; all of which was criminally foolish. Now, if a man is injured, at least on this division of the Lackawanna, when he is within the reach of one of our graduates he is treated in a practical manner, with up-to-date methods; and life has many times been saved because of the correct use of those few invaluable minutes that intervene between the injury and the arrival of a doctor. Last year over 25 cases were treated in our emergency hospital, and the boxes along the line of this road have been very frequently used.

In connection with this brief account of what has been done for the physical comfort of the employees of the Lackawanna, it will not, I trust, be amiss if I add a word concerning what the Y. M. C. A. is doing for the higher life of the men, and particularly concerning our "Engineer Evangelist."

The growth of the Railroad Branches of the Young Men's Christian Association has been phenomenal in the last few years, and these associations have been stimulated, and many men have been converted to Christianity through the influence of railroad evangelists, men who are engaged in railroading, but who obtain a leave of absence during certain months of the year, so that they can prosecute this work. James Burwick, a freight conductor on the Evansville & Terre Haute, has been engaged in this work for a number of years, and his efforts have been crowned with success, as is attested in the changed lives of many railroad men. Tom Keenan, a passenger engineer on the Lackawanna, is another man of this type.

Tom is an all-round railroad man, bluff, hearty, original and natural, and he has that vein of humor and pathos combined peculiar to the Irish race, that immediately brings his audience in sympathy with him. He was converted in true railroad style. While going down Rockport sag on the Morris & Essex Division, he all at once felt the assurance that he was saved, and immediately shouted out the fact, much to the surprise of the fireman.

Tom has done work on the Baltimore & Ohio at Baltimore, and also along the Long Island Railroad, in both places working in connection with and under the auspices of the Railroad Department of the Young Men's Christian Association.

He is now on a three months' trip through the West and Southwest, having obtained leave of absence, and the things that he is accomplishing for the betterment of the men through the agency of railroad Christianity is simply marvelous. He has already visited Indianapolis, Ind., Temple and Cleburne, Tex., where he has literally created a different atmosphere, and the lives of many of the men have been changed.

Railroad religion is a type of religion that is peculiar to this age and this time. The railroad man is in the very shadow of death when engaged in his chosen occupation, and the future world seems more real to him than to men in other walks of life. When other men are afflicted with doubts, his faith shines undimmed. The railroad man's religion is a vital everyday matter, and it is bound up in the warp and woof of his being until it becomes a part of himself. Then, too, whatever the railroad man undertakes he is tremendously in earnest about, and earnestness is the element that is very commonly lacking in professors of religion. This element is what makes the railroad man's religion so convincing.

J. L. B. SUNDERLIN, General Secretary.

American Railway Association.

The spring meeting of this association was held at the Waldorf-Astoria, New York city, on April 24, with 86 delegates present. The Executive Committee reported that during the past six months it had approved applications for membership from 12 roads. The membership is now 244 roads, operating 189,666 miles. The Executive Committee reported that excessive detail was called for in the Interstate Commerce Commission's proposed form of report of accidents under the law of March 3, 1901, and that it was very undesirable to give some of these details. A modified form of report was submitted, and this was unanimously approved.

The Committee on Train Rules recommended the adoption of the following definition of a fixed signal, covering such signals as slow board, stop board, yard limit, switch, train order, block, interlocking, semaphore, disk, ball, or other means of indicating stop, caution or proceed:

"Fixed Signal.—A signal of fixed location indicating a condition affecting the movement of a train." This definition was adopted by the association. The committee further reported that the work of compiling the Train Rules for Double Track was progressing favorably, and the committee hopes to be able to complete them for presentation in October.

The Committee on Car Service recommended a change in the last paragraph of Rule 11 of the Code of Car Service Rules as follows: "Charges for the delay of cars

shall not be refunded except on the approval of the transportation officer, designated by each road; at points where Car Service Association rules are in force such additional regulations shall prevail as those rules may provide."

Regarding the question of the responsibility for accidents in case of derailed trains, which has again been brought up, the committee reviewed the action of 1894 and of April, 1900, but could offer no further suggestion, except that members should make agreements with one another on this subject, before any occasion arises for the use of the agreement.

The Committee on Safety Appliances recommended several changes in the essential requisites for train heating, train lighting, and power brakes, previously adopted by the association. No change was made in the requisites for car couplers. The committee reported the following statistics respecting the number of freight cars fitted with air brakes and the number of engines fitted with power brakes on January 1, 1901:

Number of roads.....	154
Freight cars in service.....	1,340,241
Fitted with air-brakes.....	967,537
Not so fitted.....	372,704
Engines in service.....	34,522
Equipped with power brakes.....	34,183
Not so fitted.....	339
New equipment, other than passenger, under contract or construction:	
Freight cars to be fitted with air-brakes.....	54,118
Freight cars not to be fitted with air-brakes....	0
Engines to be equipped with power brakes.....	1,097
Engines not to be equipped with power brakes....	0

Standard Box Car.

The Committee on Standard Dimensions of Box Cars presented a report giving a history of the investigations made on the subject since 1893. These investigations show that the difficulties of the situation lie with the classifications and that to bring about the desired results a revised minimum will be necessary. The committee recommended as the standard car one 36 ft. long 8 ft. 6 in. wide, and 7 ft. 6 in. high, all inside dimensions, with a cross sectional area of 63.75 sq. ft., and a capacity of 2,295 cu. ft.; that this car be the unit upon which the classification minimums shall be based. The essentials of a standard box car, in the opinion of the committee, are the following:

That the height and the width be as great as are permitted by the physical limitations of the important railroad clearances and the present established height of loading platforms; that the length be determined by economy in construction, maintenance and operation and the requirements of economical stowage. Your committee further believes that the traffic rules governing the use of the standard car should be so framed as to provide that there be no pecuniary advantage to any interest arising from the use of cars larger or smaller than the unit car; that a premium be placed upon compact and economical stowage; that unnecessary movement and detention of cars be avoided; that the clerical work demanded be not excessive, and that the railroad be sustained in the control of its equipment. The committee further recommends that the minimum for each article taking a carload rate be adjusted to the capacity of the unit car to hold that commodity under conditions of most economical packing, either from weight or dimension limitations without increasing the charge to the shipper; that to conserve cars 34 ft. in length the minimum demanded for their use approximates nearly their capacity, and that for each article it be fixed at the capacity of a car 34 ft. long, 8 ft. 6 in. wide, and 7 ft. 6 in. high, to hold the article; that for cars shorter than 34 ft. the minimum be that of the 34 ft. car, thus making them relatively uneconomical to the shipper with the anticipation that they will eventually disappear and while in service be used for the transportation of heavy articles; that for cars longer than 36 ft. the minimums increase at a ratio in excess of the increase in length of cars, making it relatively uneconomical to the shipper to use cars of abnormal length.

At the request of the committee, after the report had been discussed, it was referred back for further consideration.

Officers.

The officers elected are: A. W. Sullivan (Ill. Cent.), President; George W. Stevens (C. & O.), First Vice-President, and W. J. Murphy (C. N. O. & T. P.), Second Vice-President. W. H. Baldwin, Jr. (Long Island), and W. F. Merrill (N. Y., N. H. & H.) were elected members of the Executive Committee.

Mr. Loree having declined a renomination for the office of President, a resolution was adopted recognizing his most efficient and satisfactory two years' service, and thanking him for the personal sacrifices he has made for the association.

The fall meeting of the Association will be held in St. Louis, Oct. 23.

Operation of the Railroads in Denmark.

The greater part of the railroads in Denmark are owned and operated by the Danish Government, although most of what is now the Government system was built by private individuals. The official calendar gives the number of Government roads as 32 with an aggregate length of 1,170 miles, and of private roads as 27, with an aggregate length of 650 miles. All the private roads are operated under Government supervision. There are seven roads under construction.

Of the locomotives running only three were built in the country and two imported from the United States. These

two were bought a few years ago for the Svendborg-Odense Railroad (30 miles). Berlin and Chemnitz have supplied the bulk of the others, some few coming from England and France. Passenger and freight cars are either built in Denmark or imported from Germany. Rails for Government and private roads are purchased in England and Belgium. The usual way of buying is by advertising for bids in the Copenhagen newspapers. The roads have been operated at a loss during the last few years, owing to cheap fares and freight rates. While the lower chamber of the Danish Congress, in which small farmers and peasants are in the majority, usually takes

Sullivan Square Station of the Boston Elevated.

The Boston Elevated Railway Company, whose elevated lines will be opened for business within a few months, has at its terminus at Sullivan Square, in the Charlestown District, a transfer station 200 ft. x 225 ft. and 90 ft. high, which resembles the large city headhouse of a long-distance steam railroad; or, at any rate, its appearance is in marked contrast to that of most structures used for a transferring place for passengers who never pay more than five cents each for the whole of a trip. This building has a high arched roof of a sin-

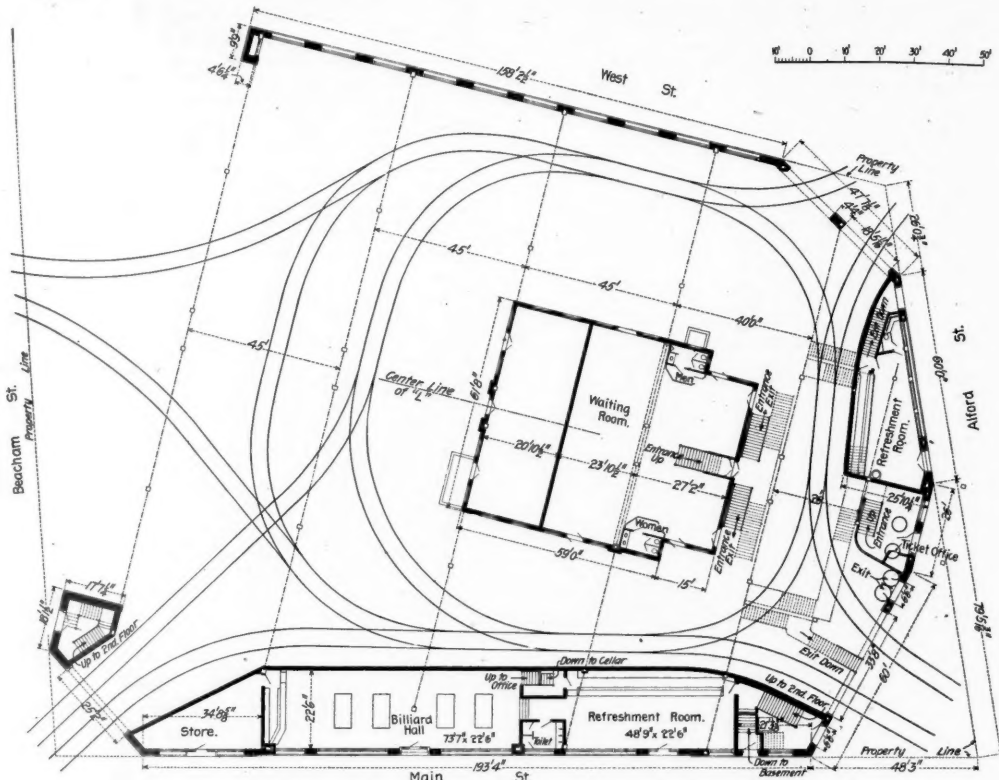


Fig. 1.—Ground Floor, Sullivan Square Station.

months or years to vote the money for a new branch road, it voted very quickly for a bill to reduce all third-class fares and freight rates in 1897. All passenger trains have first, second and third-class compartments, and since the reduction in the third-class fares, which was considerable, a number of the well-to-do class of people took to patronizing the third class, a circumstance which had not been taken into consideration by the lawmakers. Third-class fares on all the Government rail-

gle span and a large glass-covered gable end.

The drawings shown herewith, Figs. 1 and 2, show the ground floor and the elevated floor, respectively, and Fig. 3, made on a smaller scale so as to include the approaches, is a plan of the tracks which enter the upper level. The first story serves the purpose of a shed covering double loops used entirely by the surface street cars of the company. The upper floor is a headhouse for the surface cars, which reach it by an earth bank

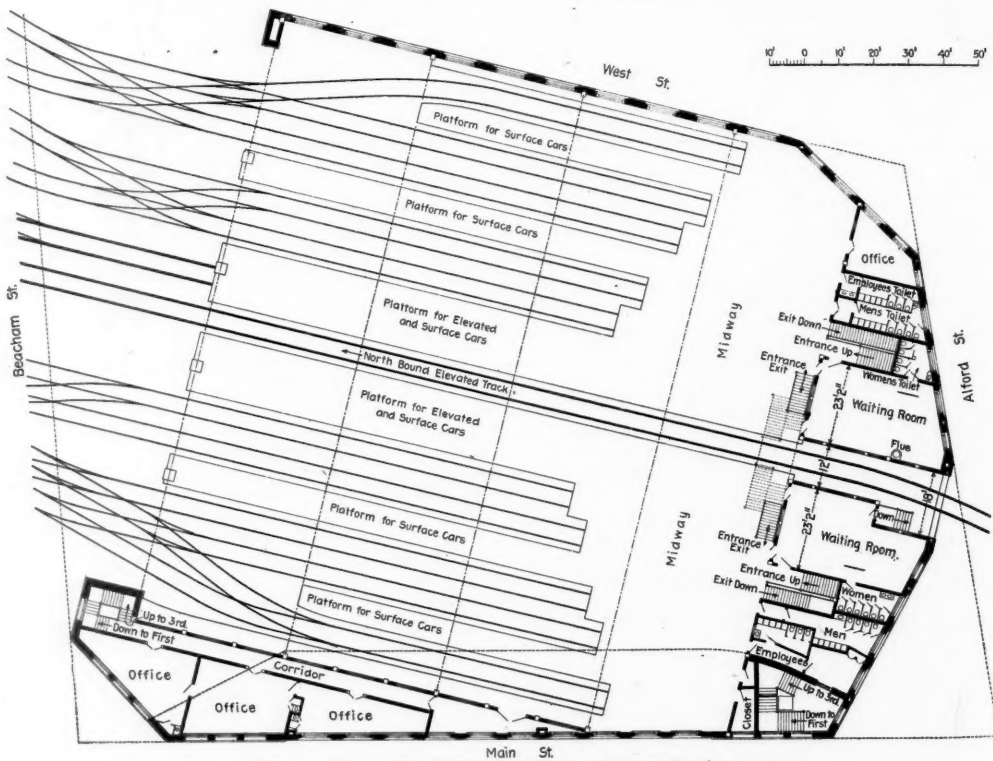


Fig. 2.—Upper Track-Floor, Sullivan Square Station.

roads are now about three-quarters of a cent a mile, but no allowance is made on return trips.

Everything from a track bolt to a locomotive might be imported from the United States, if it were not the custom to have all railroad materials manufactured under the supervision of somebody sent out from Denmark. As the distance to Germany, France and England is comparatively short, it is not so expensive to send an inspector to these countries, but the order has to be considerable to send an inspector across the Atlantic, and sufficiently large orders are seldom given.

inclined, but a through station for those on the elevated line. Only one track of the latter enters this shed. Referring to Fig. 3, the elevated cars from Boston enter the shed at the right and leave it at the left, passing round the double loop to return over the same route by which they came. The situation of the shed for storing the elevated cars is indicated by the tracks leading from the loop northward.

In the train shed the tracks of the elevated line are depressed so as to bring the floors of the cars on a level with the platform, but the tracks for the surface cars

are nearly or quite as high as the platform, so that passengers changing from one line to another, either way, have practically a level walk at all times. The surface-car stub tracks will hold four or five cars each.

The switches at the entrance to the headhouse, both in the elevated and in the surface-car tracks, are operated from a cabin at the outer end of the shed (Beacham street) by means of a single Westinghouse electro pneumatic machine.

The size of the transfer shed is 175 ft. x 175 ft. On this level are large waiting rooms, on either side of the elevated track, with ample toilet room accommodations, and executive offices, with large toilets and waiting rooms for employees. On the ground floor the frontages on the principal streets to a depth of 25 or 30 ft. are finished for store purposes, and surface tracks are brought in here and looped about a central waiting room from which ample stairways lead to both sides of the elevated platforms above. This lower transfer station will be used by local traffic.

To secure the necessary height for so large a train shed roof, and also to have more pleasing proportions for the principal facades of the building, a third story is

facilities at Wallabout, Brooklyn, were further extended, and the balance of the fund was expended in the purchase of necessary right of way.

The funds appropriated out of the income of 1900 were expended as follows:

[In the general income account is the following, deducted from net income: Extraordinary expenditures.—Amount expended in revision of grades and alignment, additional tracks, extension of piers, yards, station and other terminal facilities, improvement of bridges, abolition of grade crossings and other improvements, \$6,540,785.34.—EDITOR.]

On the United Railroads of New Jersey Division, the improvements at Harsimus and Desbrosses Street Ferry were continued, and two additional passenger tracks were laid over the Meadows between Hackensack and East Newark, that the tracks existing might be utilized in the movement of freight. Work on the New York Bay Railroad, a line intended to accommodate the traffic destined to and from points on and beyond the harbor of New York, was commenced, and a branch thereof almost completed to a connection with the meadows yard, which will enable freight trains to pass around the city

with the municipal authorities of Newark, N. J., your tracks will be elevated through that city and grade crossings abolished which are a constant menace to the safety of trains. The situation at New Brunswick, in the same State, will also require similar treatment, although at less cost, while at Trenton it will be necessary to construct a new bridge over the Delaware River to secure a proper alignment at that point. Toward these expenditures the sum of \$3,000,000 has been set aside out of the income of the year and out of the profit realized from the sale of securities. A new passenger station is also much needed at Camden, N. J., and work thereon is now in progress.

On the line between Philadelphia and Washington it will be necessary to elevate the passenger tracks in Chester and Wilmington, and increase the freight facilities at the latter point, while under legislation recently enacted by Congress, your line through Washington must be so revised as to avoid grade crossings of the public highways, the passenger station rebuilt and a new bridge erected over the Potomac River.

On your main line the time has arrived when it is necessary to push forward vigorously the completion of your four-track system. Considerable expenditure will also be required for additional terminal facilities at various points, and for real estate, power and equipment.

A purchase has also been made of a controlling interest of the Long Island Railroad Company. It is believed that the completion of the bridges and tunnels now projected and under construction, between the sections of Greater New York divided by the East River, will so increase its business as to make your investment in its shares directly profitable. Advantage is being taken of the exceptionally favorable location of its tracks in and around Brooklyn to establish freight stations, lumber and coal and car-load delivery yards for your company, and thus secure a full share of a traffic, whose growth will be largely stimulated by the policy which has been inaugurated, of placing this borough on an equal footing as to rates with other sections of the consolidated municipality. It is also in contemplation to use a part of the Long Island Railroad to form a more convenient connection between your system and that of the New York, New Haven & Hartford Railroad Company, over which a large traffic passes to and from New England points.

Form "19" for Train Orders.

"Train Despatching" was the subject of a paper read before the Rocky Mountain Railway Club at the January meeting of the club, in Denver, and at the February meeting the subject was taken up for general discussion. Mr. J. H. Abrams, Trainmaster of the Denver & Rio Grande, the author of the paper, amplified some of the points which he presented at the former meeting. The principal feature of his argument was the importance of using "19" orders wherever possible, so as to save the time used in getting signatures. To provide all necessary safeguards, however, to suit even the most cautious, Mr. Abrams would add to the code a rule like the following:

"The 19 form of order must not be used to restrict the rights of trains. It must not be used at terminals or other stations when form 31 can be used without delay to the train addressed, and must not be completed to the operator delivering the order until the train addressed is reported approaching, and it is known that the train addressed will meet no superior train at that station."

This proposition was offered to meet the criticisms of those who feared that a conductor receiving a "19" order might forget a "31" order which might be already in his hands, requiring him to wait for a first-class train.

Mr. Abrams went on to enumerate various annoyances and delays which are caused by the negligence of all sorts of employees but which are usually laid at the door of the despatcher. Where two extra brakemen have to be called, to man a freight train, the neglect of the call-boy to tell each man whether he is to go to the front or to the rear end of the train may cause enough delay to lose an important meeting point. The general passenger agent who schedules a flag stop at a station where nobody but a dead head ever boards a train is one of the minor enemies of the despatcher. The engineman who, when requested to report by telegraph how soon he will be ready to start, replies "I don't know" is a good subject for discipline.

Mr. T. H. Sears, Superintendent of the Colorado & Southern, told of the very satisfactory nature of his experience with "19" orders. Often the saving of time helps a train one station farther along. Mr. Sears said that, on the Burlington, form "19" is used to give orders to the train of superior right, provided a stop signal can be displayed at two train-order offices between the train and the proposed meeting point.

Mr. Quereau said that on the Burlington road, as stated to him by a despatcher, the average time saved by each "19" order, for a number of months, on that road, was seven minutes. On the Denver & Rio Grande, between Denver and Pueblo, 120 miles, each train receives on an average 10 or more orders, so that a saving of seven minutes on each order might often save over an hour in a single run.

The Saxon State Railroads have been trying their speed. April 2 a train of seven cars was hauled from Dresden to Leipsic, 73 miles, in 81 minutes, and back in just the same time; while the best time theretofore over the line was 117 minutes. The greatest speed reached during the fast run was at the rate of 77½ miles per hour.

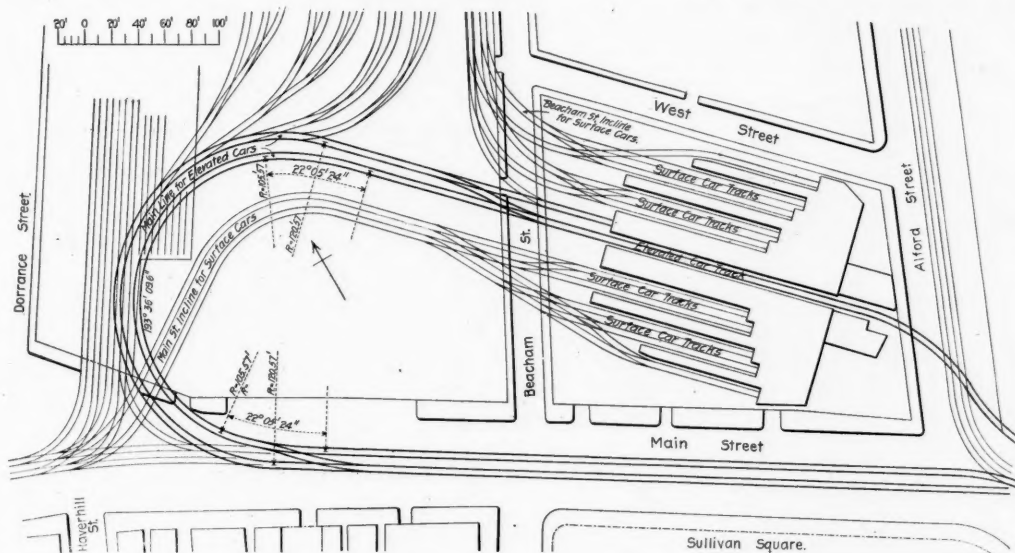


Fig. 3.—Sullivan Square Station, Boston Elevated Railway—Junction of Elevated and Surface Lines.

added on the principal street fronts, which will be utilized for general office purposes.

The structure is of brick, with granite and limestone trimmings, and the whole is built on a rigid steel frame, designed in connection with the elevated track structure. In the larger and more open waiting spaces the finish is enameled brick and metal; in the waiting rooms it is oak.

The principal currents of traffic using this station will be those of the surface lines to and from the north on Alford street; the surface lines to and from the northwest on Main street, and the elevated lines to and from the center of the city. There is also the present surface line to and from the city.

Improvements on the Pennsylvania Railroad.

Some weeks ago we reviewed the 44th annual report of the Pennsylvania Railroad, being for the year 1900. The pamphlet report is now issued, and from it we take the following remarks by the President on improvements recently made and to be made. As the report is dated March 5 this is the latest official information.

The charges to capital account during the year amounted to \$1,670,355.16, as follows:

Real estate	\$485,355.16
Locomotives	440,000.00
Car trust equipment.....	465,000.00
Branch roads	280,000.00

The first item represents the cost of property acquired in Pittsburgh in connection with the elevation of tracks in that city, and of real estate needed for terminal facilities in Philadelphia, Harrisburg and Altoona. The charges to motive power and equipment represent one-half of the cost of additional locomotives needed to move the traffic, and the usual charges on account of car trust equipment. The charge to branch roads covers the purchase of the Youghiogheny Railroad, a small coal road about 10 miles long, running from your main line at Irwin, southward to Gratztown on the Youghiogheny River.

Through the special appropriation of \$1,500,000 made out of the income of 1899 for extraordinary expenditures, the revisions of the line at Elizabethtown, Spruce Creek and Irwin, which had been under progress for several years, were completed. The improvement at Elizabethtown completed the double track on your passenger line, between Lancaster and Middletown. Work was also begun on the improvement of the alignment of the Middle Division at Iroquois and Durward, and near Huntingdon, in connection with the extension of the four-track system, and the line between Altoona and Gallitzin was equipped with pneumatic automatic signals. The pier

of Newark without interfering with the passenger service. The elevation of the Kensington Branch of the Philadelphia & Trenton Railroad in the northeastern part of the city of Philadelphia was further prosecuted, and a new passenger station erected at Germantown Junction. The income of the United Railroads of New Jersey was sufficient, after providing for all obligations connected with the lease, to defray the cost of the extraordinary expenditures thereon.

On the main line between Philadelphia and Pittsburgh the chief expenditures were in the construction of additional tracks, the improvement of yards at terminal points, the extension of piers, the reconstruction of bridges and stations and the construction of short branches.

The four-track system was further extended west of Coatesville, on the Philadelphia Division, so that with the exception of the crossings of the Brandywine and Conestoga, at Coatesville and Lancaster, respectively, it is now complete from Jersey City to Harrisburg. This work was also prosecuted on the Middle Division between Aqueduct and Port Royal, and west of Huntingdon; and with the completion of the new tunnel through Tussey's Ridge, and the widening of the old tunnel, the four tracks are now in service from Mill Creek to Spruce Creek. On the Pittsburgh Division this system was completed between Altoona and Lilly's, and between Manor and Shafton, while the revision of the line at Irwin's, already referred to, included a four-track system at that point and its extension west to Larimer. Of the line between Jersey City and Pittsburgh, a distance of 440 miles, 311 miles of four tracks are in use, leaving 129 miles yet to be built to complete the system.

The construction of a stone arch bridge over the Susquehanna River at Rockville is rapidly progressing, and the work of rebuilding the passenger station at Pittsburgh is also being pushed forward. The Petersburg Branch was extended from Petersburg to a connection with the existing road at Aetna Furnace, thus completing an alternate line between Petersburg and Altoona via Hollidaysburg, and furnishing much needed facilities for the limestone traffic from that territory.

On the Pittsburgh, Virginia & Charleston Railway, the heaviest expenditure was in the acquisition of right of way and real estate for a revision of the line through South Pittsburgh, and the construction of a four-track system from that point to Thomson, a distance of about 11 miles, and for additional yard facilities.

The demands of traffic will necessitate a large outlay during the current year. In addition to the Pittsburgh Station, the elevation of the tracks, and the reconstruction of passenger terminals at that point, like expenditure will be required at other important points on your lines to avoid grade crossings and facilitate the movement of traffic. Under arrangements just concluded

The Conveyance of Freight on Electric Roads.

The possibility that the rapidly extending electric roads will soon pick up a good deal of the light freight and express business of the steam railroads has now the careful consideration of a good many railroad officers. The projects for the development of such business in the neighborhood of great cities are numerous and some of them are actually developing. The upshot it would be rash to predict. Meantime, the same question has arisen in England, and in the first issue of *Traction and Transmission* (London) we find an article by Mr. Alfred H. Gibbings dealing with projects for serving the region about Manchester, and between Manchester and Liverpool, by electric roads. As this country originates an enormous shipment of manufactured goods it has long been one of the most important traffic centers of the United Kingdom. The population is so dense and the amount of material turned out and consumed so great that the region seems to offer special temptations to the development of electric freight service. We feel justified therefore in reprinting below a part of Mr. Gibbings's first

Liverpool and Prescott Light Railway.—Gage 4 ft. 8½ in. Length of street miles, 3½. Now in course of construction. Adjoins the lines of the Liverpool Corporation at Knotty Ash and the St. Helens Tramways at Prescott. St. Helens Tramways.—Gage 4 ft. 8½ in. The total mileage of single track in operation is 18½ miles. It will join the Liverpool and Prescott Light Railway at Prescott, and the South Lancashire Tramways at Haydock and Burtonwood, respectively. South Lancashire Tramways.—Gage 4 ft. 8½ in. This system will connect with the St. Helens Tramways at Haydock and Burtonwood on the Liverpool side, and with the Eccles Tramways on the Manchester side. The tramways will comprise two main trunk lines, one from Haydock, through Hindley, Westthroughton and Walkden, to Swinton, where it meets the tramways leased to the Salford Corpora-

Oldham, Ashton and Hyde Tramway Company.—Gage 4 ft. 8½ in. Length of line 8½ miles. Adjoins proposed route of Hyde Corporation Tramways near Market street, Hyde. Staleybridge, Hyde, Dukinfield and Mossley Joint Corporation Board.—Gage 4 ft. 8½ in. Length of single track at first proposed will be 30 miles. These may be extended. No connection with any other system at present.

In the foregoing description, and on the map, many lines have been included which are not yet constructed. It will be seen that this extensive network forms a complete means of through traffic from any one district to the other, with the exception of Wigan, Darwen, and beyond, in which cases the gage of the rails is less than 4 ft. 8½ in. In order to convey goods from Liverpool, Manchester, etc., to these towns, it would, of course, be necessary to transship them.

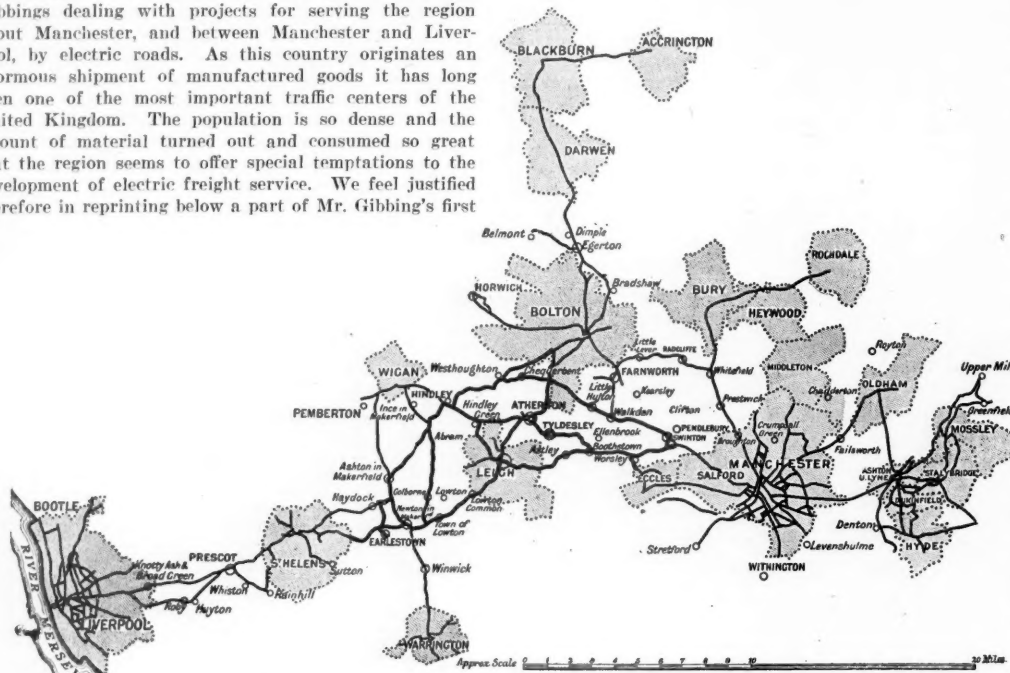
The success which has everywhere attended the introduction of electric traction for passenger traffic, will, it is to be hoped, have the effect of rapidly extending the system, and when the carriage of goods is once seriously undertaken, it may be found feasible and necessary to extend them for this purpose alone. The contention, of course, is that what can be done on the railways in this way can be done more satisfactorily, expeditiously, and cheaply by electric traction. I do not intend at present to enter upon what is nevertheless a very interesting matter, viz., the actual and essential characteristics, and the economical aspect of the carriage of goods on these electric light railways, but I shall reserve it for a second article.

Brooks Locomotives for the Pere Marquette.

The Brooks Locomotive Works recently built for the Pere Marquette Railroad five Chautauqua type passenger locomotives similar to those illustrated in the *Railroad Gazette*, Nov. 30 and April 26, with some differences in detail, such as valve gear and other parts where individual choice might rule; also four mogul freight locomotives and six consolidation freight locomotives, one of the latter being illustrated herewith. The consolidation engines have cylinders 20 x 26 in., driving wheels 56 in. in diam. with cast-steel centers; 15,000 lbs. on the two-wheeled radial-and-swing engine truck; and 148,000 lbs. on driving wheels, giving a total of 163,000 lbs. in working order, the tender loaded weighing 92,000 lbs. The driving wheel base is 15 ft. 6 in. and the total wheel base of engine 24 ft. 4 in., with a length over all for engine, 39 ft. 3½ in., and over engine and tender 62 ft. 6 in. The height of the center of boiler above rail is 9 ft. 4 in., and the height of stack above rail 14 ft. 10 in. There are 225.5 sq. ft. of heating surface in the fire-box and 2,245 sq. ft. in tubes, giving a total of 2,470.5 sq. ft. of heating surface, for a grate area of 55 sq. ft., the fuel being bituminous coal.

The boiler is of the improved Belpaire wagon-top type, the barrel being 66 in. in diam. at the front ring and 71½ in. in diam. at the throat. The fire-box is 74 in. wide, 108 in. long, 69 in. deep at the front and 52 in. deep at back. The crown sheet is stayed with direct stays and the working steam pressure is 200 lbs. per sq. in.

The tender is of the straight-top 8-wheeled steel-frame type with steel Z bar underframing and Fox pressel steel trucks, the capacity being 4,500 gals. of water and 10 tons of coal. The design of these locomotives is shown in line



Existing and Proposed Electric Railroads About Liverpool and Manchester.

article, together with a reproduction of the sketch map showing the electric lines existing and proposed.

Neither railway nor canal will ever be capable of such extension as to avoid the necessity for the subsidiary use of carts or other vehicles to aid in the work of collection and distribution, and it is these charges which so largely increase the cost of transportation. Some attempt has recently been made, under the Locomotion on Highways Act, 1896, to reduce the cost of conveyance of goods between railway and canal depots and the mills, warehouses, etc., by automobiles, but however excellent the automobile may be compared with horse traction, the substitution does not go far enough—it does not appreciably affect the cost of conveying goods in large quantities over large areas. The new method of transit by which it will be possible to convey goods over a very large area of South Lancashire, is that of the electric trolley, or electric light railway system, but before proceeding to deal with this matter in detail, it will be as well to consider briefly what has been done in a similar direction in the United Kingdom.

Very little has yet been accomplished in the United Kingdom towards perfecting a system of freight conveyance. In many cases small goods and parcels are conveyed; practically no special truck or carrier has been designed or is used for traffic on the lines of an overhead trolley system. The only instances, so far as I have been able to ascertain after careful inquiry, are those of the Douglas and Laxey Light Railway in the Isle of Man, and the Bessbrook and Newry line. Each of these systems is arranged, however, for special goods traffic. Nearly all the tramways in England which have been constructed under the authority of an Act of Parliament, or by a provisional order of the Board of Trade, have powers to carry goods, and each act or order contains a schedule prescribing what toll and charges the company are empowered to levy.

The cities of Liverpool and Manchester and the intervening district have been remarkably associated with schemes of transit for both passengers and goods. From the date of the first Liverpool & Manchester Railway, in which many difficult engineering problems had to be solved, to the latest developments of the Ship Canal and electric tramways, the healthy rivalry between the two cities has given this district, with its enormous industrial populations, a world-wide importance and renown. Each and all of these systems are concerned, mainly, in providing and maintaining links of communication between the two great termini of Liverpool and Manchester, and a few principal towns which lie en route. It may be said, indeed, that they scarcely contemplate going beyond this. But the scheme of electric traction is one of broader purpose and utility: it is intended not only to link together all the large towns over a wider area, but also to stretch into, and serve the needs of, the country round about, on the right hand and on the left, waiting on its customers, one might almost say, at their very doors. Such a system is illustrated in the map which indicates at a glance its immense possibilities.

Liverpool Corporation.—Gage 4 ft. 8½ in. The total mileage of single track now in operation is 84 miles. This will be increased shortly to 102 miles. The tramways reach to the boundaries of the city.

tion, and the other from St. Helens, through Earlestown, Leigh and Worsley, to the boundary of the borough of Eccles, where it also meets the tramways leased to the corporation of Salford. There are also branch lines. A considerable portion of these tramways will be completed in about twelve months.

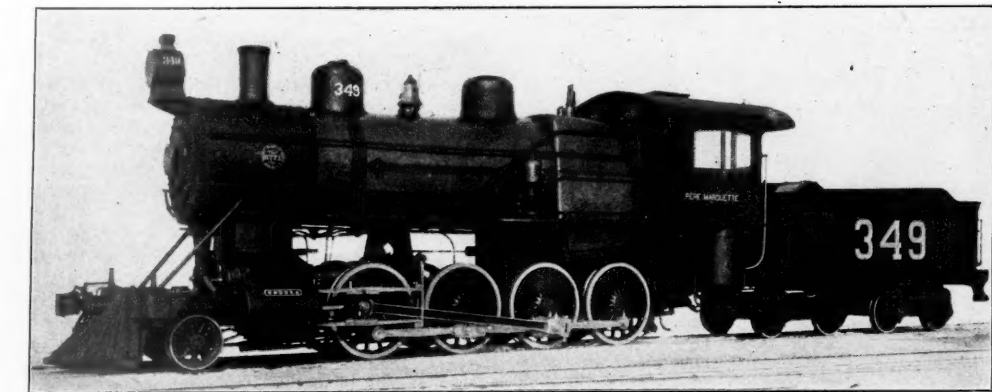
Wigan Corporation.—Gage 3 ft. 6 in.; total mileage 1½ miles. Also Wigan and District Tramway Company, total mileage running about 6½ miles. Also a light railway from Pemberton to Ashton, same gage, length 3½ miles.

Bolton Corporation.—Gage 4 ft. 8½ in. The total mileage running is 25 miles, which may shortly be extended to 40 miles. At present these lines do not adjoin those of any other system.

Bolton, Turton and Darwen Light Railways.—Power being applied for. Gage 4 ft. 8½ in. Length in street miles 9½. Commences in the urban district of Turton at the termination of the Bolton Corporation Tramways, and extends to the center of Darwen.

Darwen Corporation.—Gage 4 ft. The total mileage 2 miles 1,500 yards.

Blackburn Corporation.—Gage 4 ft. The total mileage running is 5½ miles, but this will shortly be extended to 15 miles.



Brooks Wide Fire-Box Consolidation Locomotive for the Pere Marquette Railroad.

Accrington Corporation.—Gage 4 ft. There are 9½ miles in operation, but up to the present these are steam tramways.

Farnworth Urban District.—Gage 4 ft. 8½ in. A portion of these lines is worked by the Bolton Corporation. Powers have been obtained for about 5½ miles.

Radcliffe Urban District.—Gage 4 ft. 8½ in. Powers obtained for about 6 miles.

Whitefield Urban District.—Gage 4 ft. 8½ in. Length 2 miles.

Bury Tramways Company.—Gage 4 ft. 8½ in.

Rochdale Tramways Company.—Gage 3 ft. 6 in.

Warrington Corporation.—Gage 4 ft. 8½ in. Total mileage authorized 7 miles. These tramways will connect with the South Lancashire scheme by a line (if authorized) through Winwick to Newton, for which powers are now being sought.

Eccles Corporation.—Gage 4 ft. 8½ in. Total mileage 5½ miles. The lines will join those of the South Lancashire Tramways at Worsley, and at present join the lines of the Salford Corporation at the borough boundary.

Salford Corporation.—Gage 4 ft. 8½ in. There are at present 20 miles of single track, which will shortly be extended to 34 miles. These lines adjoin those of the Eccles Corporation and Swinton Corporation, respectively, the latter lines being leased to the Salford Corporation. In addition, running powers are held over the Manchester Corporation Tramways, and ultimately a junction with the South Lancashire Tramways will be effected at Swinton.

Manchester Corporation.—Gage 4 ft. 8½ in. About 56 miles in operation or approaching completion. This length will be increased during the present year.

drawings and half-tone illustration from a photograph appearing herewith.

Passenger Engines.

The Chautauqua type passenger locomotives have cylinders 18 in. x 26 in.; driving wheels 72 in. in diam. with cast-steel centers, leading truck wheels 33 in. in diam. and trailing wheels 51 in. in diam. The weight on leading wheels is 32,000 lbs.; on driving wheels, 83,000 lbs., and on trailing wheels 27,000 lbs., a total of 142,000 lbs., and the loaded tender weight is 98,000 lbs. The driving wheel base is 6 ft. 8 in.; the total wheel base of engine 26 ft. 4 in.; the length over all of engine 37 ft. 5½ in.; and the total length of engine and tender 60 ft. 3 in. The height of the center of boiler above rail is 9 ft. 1 in. and the height of stack above rail 14 ft. 10½ in.

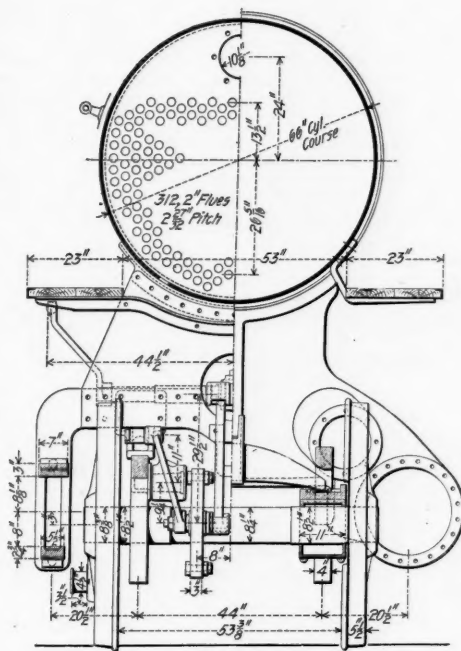
There are 182 sq. ft. of heating surface in the fire-box and 1,892 sq. ft. in tubes, making a total of 2,074 sq. ft., for a grate area of 42.3 sq. ft. The boiler is the improved Belpaire wagon-top and carries 200 lbs. working steam pressure. The diameter of the barrel at front is 58 in. and at the throat 63½ in., the crown sheet being stayed with direct stays. The fire-box is 68 in. wide, 90 in. long, 65¼ in. deep at front and 55¼ in. deep at back.

Mogul Freight Engines.

The mogul engines have cylinders 19 in. x 26 in.; a two-wheeled radial-and-swing leading truck with wheels 30 in. in diam.; and driving wheels 56 in. in diam. with cast-steel centers. The weight on leading truck is 16,500 lbs. and on driving wheels 122,000 lbs.; a total of 138,500 lbs., the loaded tender weight being 92,000 lbs. The driving wheel base is 15 ft.; the total wheel base of engine 23 ft. 11 in.; the length over all of engine 37 ft. ½ in., and the length over all for engine and tender 60 ft. 3 in. The height of center of boiler above rail is 8 ft. 6½ in. and the height of stack above rail 14 ft. 6 in. There are 178 sq. ft. of heating surface in the fire-box and 1,708 sq. ft. in the tubes; a total of 1,886 sq. ft. for a grate surface of 30.8 sq. ft.

The boilers of these engines are also of the improved Belpaire wagon-top type, the diameter of the barrel at front being 62 in. and at the throat 67¼ in. The working steam pressure is 200 lbs. per sq. in. and the crown sheet is stayed with direct stays. The fire-box is sloping, 109 in. long, 42 in. wide, 75 in. deep at front and 60 in. deep at back. The tender for this class of engine is of the straight top 8-wheeled steel-frame type, the under frame being made of Z bars. The tender of the Chautauqua type engine is similar except that it has a sloping top and steel channel underframing. In each case the capacity is 4,500 gals. of water and 10 tons of coal, the trucks being Fox pressed steel.

The three classes of engine are equipped with American brakes on drivers and Westinghouse brakes for tender and train service; 9½ in. Westinghouse air pumps; Detroit sight feed lubricators; Ashton safety valves; Ohio injectors; Gold steam heating apparatus; Detroit springs; U. S. metallic packing for piston rods; and Brooks Locomotive Works packing for valve stems.



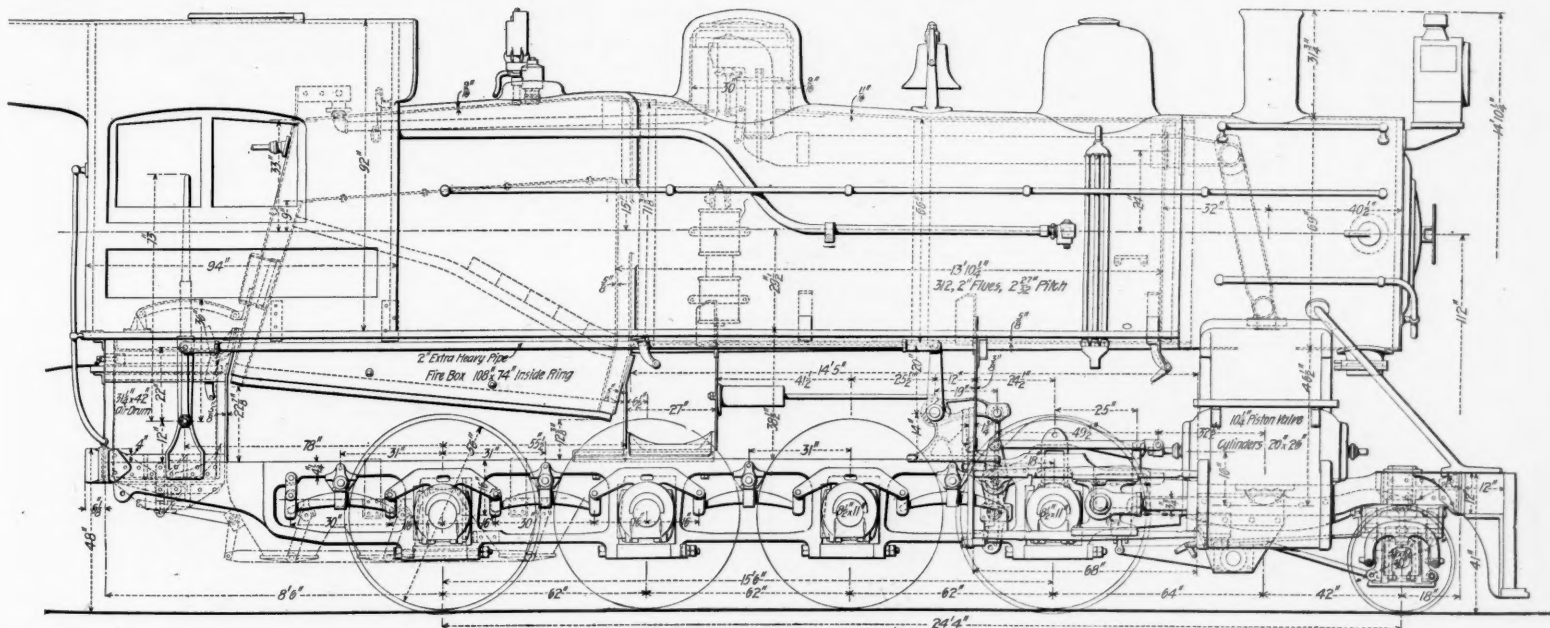
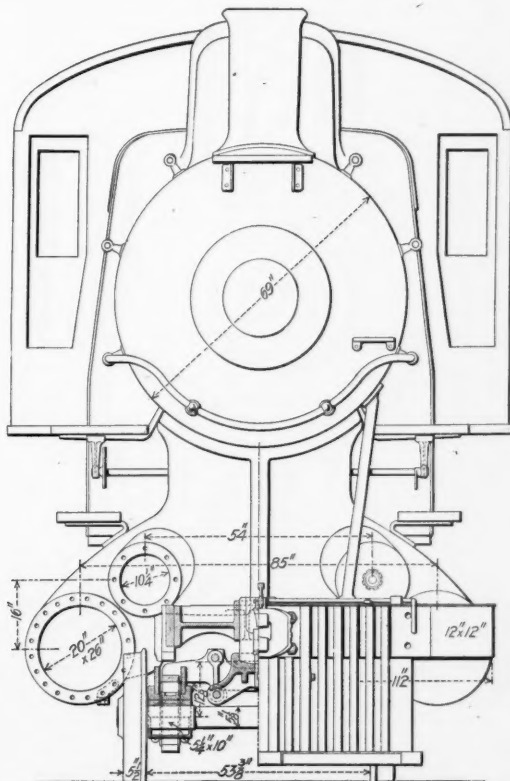
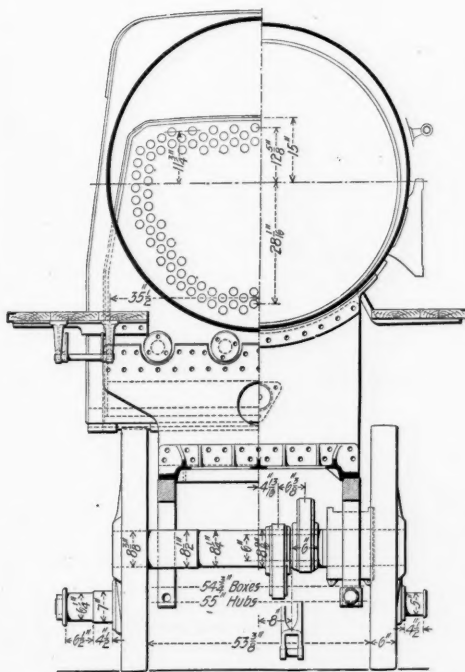
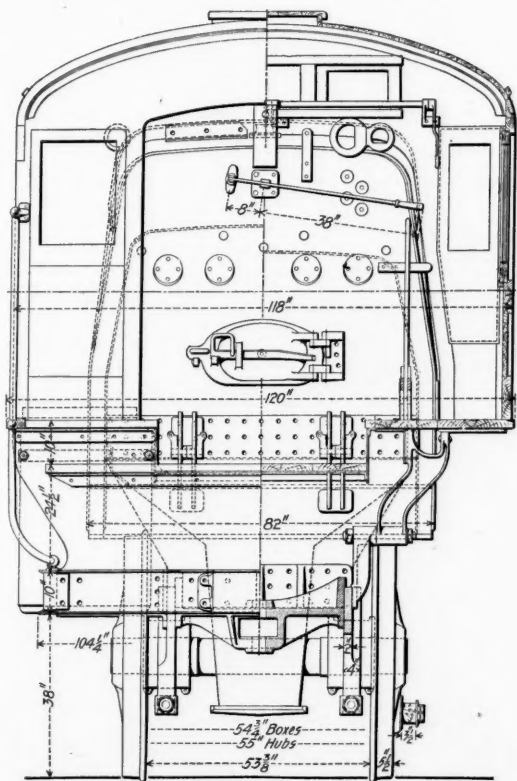
Destruction of a Half-Through Girder Span.

BY PHILIP AYLETT, *Bridge Engineer Seaboard Air Line.*

[In the Proceedings of the American Society of Civil Engineers for November, 1900, appeared a paper on "Some Peculiar Railroad Bridge Accidents." Discussion of that paper appeared in the January issue, and Mr. Aylett's contribution, which follows, is taken from the April Proceedings.]

A few weeks ago there occurred, on an important railroad system traversing the Southern states, one of the most remarkable bridge accidents of which the writer has knowledge. This disaster occurred at the crossing over a small stream some 150 ft. in width, and with an average depth of 8 ft. That portion of the structure over the channel consisted of a 50-ft. half-through girder span, while on the east and west approaches there were 1,232 ft. and 118 ft., respectively, of cypress pile trestling. The spacing of the girders was 12 ft. from center to center of the webs, and the cross-ties or floor beams were 12 x 12-in. x 12-ft. pine, resting on shelf angles riveted to the webs of the girders. There is a heavy ascending grade in both directions from the river, and it is presumed that trains attained a high rate of speed in crossing the stream in order to facilitate the climbing of the opposite grade. The girders were supported by three pile-bents (cypress) under each end, each bent having five piles, these being sawed off and capped with two (criss-cross) layers of 12 x 12-in. timbers, drift-bolted to the piling, upon which the girders rested. The wooden portion of the structure had recently been rebuilt, and the girders were reported to have been in first-class condition and amply sufficient for any traffic to which they would be subjected.

On Dec. 14, 1901, while a local east-bound freight



Brooks Wide Fire-Box Consolidation Locomotive for the Pere Marquette Railroad.

train, containing 38 cars loaded with cross-ties, lumber and naval stores, was crossing this stream, and after the engine and eight cars had crossed the girder span, the girders were suddenly knocked from their seats by the derailed trucks or body of a box car, the ninth car from the engine, this car striking the end of the downstream girder. The fall of the span precipitated 27 of the following cars into the river, breaking down the pile-bents of the west portion of the trestle until the wreckage had completely filled this space and was piled up over 50 ft. above the base of rails. A flat car stood vertically at the summit of this pile of wreckage.

The box car which struck the girder became derailed some 250 ft. before reaching the trestle, as was indicated by the flange marks on the cross-ties, and the car was leaning well over to the right when it reached the girder span. Upon striking the girder, the car knocked off its front cross-beam and lost both trucks, and, although loaded with cross-ties, passed over the opening and slid 60 ft. beyond, upon the undamaged portion of the trestle. The caboose and one car stopped at the foot of this mountain of wreckage. The engine with eight cars passed over the girders safely before these were struck by the ninth car, which, although truckless, followed closely behind.

Five days were consumed in reopening the line for traffic, and it would have been impossible to have accomplished it in that time had not the wreckage been burned to the water level, while fire engines were kept constantly playing upon the adjacent undamaged trestle. Even after the wreckage had been burned to the water level, great difficulty was encountered in pile-driving on account of the sunken timber, barrels of resin, etc., the bed of the river being filled almost solidly with debris and naval stores.

The writer has always been of the opinion that "through girders" were subject to damage and accidents to a greater extent than "through truss spans" in the case of derailments, and has always been opposed to that abominable practice, so much resorted to in cheap through-girder construction, of resting the ties (or floor-beams) upon bottom flanges or angles riveted to the webs of the girders above the bottom flanges in lieu of a complete floor system of metal floor beams and stringers with riveted connections.

In this case, however, the cause cannot be attributed, in any direct way, to the shelf-angle construction. The writer believes, however, that possibly this disaster would have been avoided had these girders been protected by inside bridge guards, and also probably avoided had the girders been spaced further apart. It is the writer's practice to space "through girders" 14 ft. and over between centers of flanges of girders, using a steel floor system with riveted connections, all through girders having inside guards.

The direct cause of the derailment was a broken flange in one of the wheels of the ninth box car, portions of this flange being found 500 ft. from the west end of trestle approach.

Train Accidents in the United States in March.

COLLISIONS.

Rear.

1st, on Louisville & Nashville, near Warrior, Ala., rear collision of freight trains due to insufficient flagging; one brakeman and one tramp injured.

2nd, on Texas Midland, near Quinlan, Tex., a passenger train ran into the rear of a preceding work train, damaging engine and two freight cars; engineman injured.

4th, on Illinois Central, at Obion, Tenn., rear collision of passenger trains, doing slight damage. The fireman jumped off and was injured.

5th, on Southern Pacific, at Riddle, Ore., rear collision of freight trains, wrecking engine and several cars; engineman injured. There was a dense fog at the time.

5th, on Kansas City Southern, at Rust, Ark., a work train ran into the rear of a preceding local freight, wrecking the caboose and several cars. A passenger was fatally injured.

7th, on Pennsylvania road, near Coatesville, Pa., eastbound passenger train No. 20 ran into the rear of a preceding freight, wrecking three empty baggage cars, one postal car and three freight cars. The passenger engine (except its front truck) lodged in a nearly horizontal and natural position on the top of a carload of coal. The passenger train had received a caution signal at the last preceding block station and was moving at about 40 miles an hour when it struck the freight. One of the baggage cars fell against a signal cabin. No person was seriously injured.

8th, on Nashville, Chattanooga & St. Louis, at Centreville, Tenn., a passenger train ran into the rear of a preceding freight, badly damaging the engine. The engineman and two other trainmen were injured, the former fatally.

9th, on New York Central & Hudson River, at Cedar Run, Pa., a freight train broke in two and the rear portion afterward ran into the forward one, wrecking seven cars. Two trainmen were injured.

10th, 1 a. m., on Illinois Central, near Russell, Tenn., a freight train, unexpectedly stopped, was run into at the rear by a following freight; engineman injured.

12th, on Chicago & Northwestern, at Arlington Heights, Ill., a freight train ran into the rear of a preceding stock train, wrecking the caboose. Two drivers riding in the caboose were killed and two others were injured.

14th, on Lehigh Valley road, near Landsdown, N. J., a freight train ran into the rear of a preceding freight, wrecking several cars; two trainmen injured.

24th, 6:30 a. m., on Central of New Jersey, at Glen Gardner, N. J., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking a tank car filled with oil, which took fire and exploded. Ten cars of oil in the rear portion of the train caught fire and there was a series of explosions which, with the liberated oil, caused a great

conflagration. The collision occurred on an embankment and the oil ran down the bank into the streets of the village. A lumber yard was set afire and the flames spread to the Masonic Temple, post office and a dozen other buildings, causing a loss of several thousand dollars. The occupants of the houses in the path of the blazing flood of oil had to flee for their lives. The men of the village, with the help of fire companies from Somerville and Washington, had to fight the fire about 12 hours. Many of the men were burned. The front portion of the freight train when detached was stopped by the automatic application of the air-brakes, so that it was impossible to get it out of the way of the rear portion, which was only partially air-braked.

25th, on Lake Shore & Michigan Southern, near Derby, N. Y., a passenger train ran into the rear of a preceding freight, damaging the caboose and three cars. A driver riding in the caboose was injured.

26th, 2 a. m., on Pennsylvania road, at Elizabeth, N. J., a freight train which had been unexpectedly stopped was run into at the rear by a following freight, wrecking several cars and blocking all four main tracks. A building near the track was damaged. A brakeman was injured. There was a dense fog at the time.

30th, on Erie road, near Phalanx, Ohio, passenger train No. 22 ran into the rear of a freight, damaging the engine and two freight cars; engineman injured.

And 13 others on 7 roads, involving 3 passenger and 18 freight and other trains.

Butting.

2nd, 5 a. m., on Southern Railway, near Lenoir City, Tenn., butting collision between two locomotives, each drawing a caboose, making a bad wreck. Four trainmen were killed and eight others were injured, two of them fatally. It is said that one of the trains disregarded a second meeting order which had been sent to it, countermanding a previous order.

3rd, on Baltimore & Ohio, near Egypt, Pa., butting collision of freight trains, due to a misunderstanding of orders; two trainmen injured.

6th, on Norfolk & Western, at Addison, Va., butting collision of freight trains, due to a misplaced switch, engineman and fireman scalded.

12th, on Jamestown & Chautauqua, near Point Chautauqua, N. Y., butting collision between a passenger train and a freight, near a meeting point. Three trainmen were injured.

15th, 2 a. m., on Illinois Central, at Mayfield, Ky., butting collision of freight trains, wrecking both engines and many cars. Three trainmen were killed and several other trainmen were injured.

19th, on Union Railroad, near Pittsburgh, Pa., butting collision of freight trains; four trainmen injured.

19th, on Burlington & Missouri River, near Johnson, Neb., eastbound passenger train No. 98 ran into westbound freight No. 113, which was stuck in a snowdrift. The passenger fireman was killed and the engineman injured. There was a blinding snowstorm at the time and it is said that the passenger train ran past torpedoes and a flag.

22nd, on Louisville & Nashville, near Wilcox, Ala., butting collision of freight trains; one engineman killed, one fireman fatally injured. It is said that one of the trains disregarded an order to wait at Wilcox for the other.

23rd, on Plant System, near Montgomery, Ala., butting collision of passenger trains; one fireman killed, four other trainmen injured.

24th, on Atlanta, Knoxville & Northern, near Chattanooga, Tenn., butting collision of freight trains; one trainman injured.

26th, on New York, Ontario & Western, at Trout Brook, N. Y., a northbound freight train ran into a southbound freight standing at the station, doing slight damage. One fireman was killed. The engineman of the northbound train disregarded a telegraphic order directing him to stop at Trout Brook to meet the other train. He also ran past an automatic station block signal which was against him.

26th, on Louisville & Nashville, near Brewton, Ala., butting collision of freight trains, one of them drawn by two engines; one engineman injured.

27th, on Chicago & Northwestern, at Little Rapids, Wis., a passenger train ran over a misplaced switch and into the head of a freight train standing on the side track, overturning the passenger engine and two of its cars and wrecking several freight cars. Two passengers and four trainmen were injured.

28th, 4 a. m., on Boston & Maine, at Schaghticoke, N. Y., butting collision of freight trains, wrecking both locomotives and seven cars. Three trainmen were killed and three others injured. At the point where the collision occurred trains were running on single track on account of bridge repairs and trains were admitted to the single-track portion of the line by red lights, one giving the right to the road to westbound trains and two giving it to eastbound trains; it is said that one of the enginemen mistook or disregarded the signal. This engineman had been asleep on his moving engine a short time before the collision.

28th, on Chicago & Alton, near McLain, Ill., butting collision of passenger trains, badly damaging both engines; one engineman killed.

29th, on Louisville & Nashville, near Pollard, Ala., butting collision of freight trains, one of which was drawn by two engines. All three engines and several cars were badly damaged. One brakeman was injured.

And 6 others on 3 roads, involving 1 passenger train and 7 freight and other trains.

Crossing and Miscellaneous.

6th, on Kansas City, Memphis & Birmingham, near Memphis, Tenn., collision of freight trains; one trainman injured.

7th, 1 a. m., on Missouri, Kansas & Texas, at Caney, Ind. T., collision between a freight train and some unattached cars on a side-track, making a bad wreck, which took fire and was partly burned up; engineman and fireman injured.

7th, 2 a. m., at South Tenth street, Pittsburgh, Pa., a freight of the Pennsylvania road collided with a locomotive of the Allegheny & South Side Railroad, the collision being due to a misplaced switch. One trainman was killed and two were injured.

9th, on New York Central & Hudson River, at Buffalo, N. Y., a locomotive ran into a car of naphtha and the naphtha took fire, causing a serious explosion. An iron signal cabin on a bridge spanning the tracks near the place of collision was ruined by the intense heat from the fire, and a number of dwelling houses were blackened by the smoke and somewhat damaged by the heat.

11th, on Grand Trunk, at Gorham, N. H., a freight train drawn by two engines ran over a misplaced switch and collided with a locomotive standing on or near a turntable. One employee was killed and two others were injured.

12th, on New Orleans & Northeastern, at Meridian, Miss., collision of freight trains; one trainman injured.

18th, on Virginia & Southwestern, at Inman, Va., an engine ran into some freight cars, doing slight damage. A boy was fatally scalded and a brakeman was injured.

19th, on Cleveland, Cincinnati, Chicago & St. Louis, at Cincinnati, Ohio, collision of locomotives; two trainmen injured.

20th, on Chicago & Eastern Illinois, at Terre Haute, Ind., a passenger train was turned by a misplaced switch through a crossover track and into the side of a freight train. The engine was overturned and all but two of the passenger cars were derailed. The fireman was killed. The vestibules of the passenger cars were somewhat damaged, but the glass in the windows in the sides of the cars was not broken, though the train was running fast. The freight train, several cars of which were wrecked, stood at the left side of the main track and the misplaced switchstand, a low one, was on that side.

21st, on Erie road, at Bergen, N. J., collision between an empty engine and a freight train, wrecking several cars; one engineman fatally injured.

21st, on Philadelphia & Reading, at Birdsboro, Pa., collision of freight trains; one brakeman killed.

22nd, 8 p. m., on Erie road, near Levings, Ind., collision between express train No. 13 and a freight train; one engineman injured.

24th, on New York Central & Hudson River, at Kerr-moor, Pa., collision of the cars of a freight train during switching operations, wrecking 21 cars. The engineman was fatally injured.

And 15 others on 14 roads, involving 3 passenger and 23 freight and other trains.

DERAILMENTS.

Defects of Roadway.

13th, on Leavenworth, Kansas & Western, near Soldier, Kan., passenger train No. 42 was derailed by a broken rail; 11 passengers injured.

And 3 others on 3 roads, involving 3 freight trains.

Defects of Equipment.

29th, on Southern Railway, near Burnsville, Ala., a freight train was derailed by a broken axle while running at high speed and 12 cars were ditched; a brakeman was killed.

And 17 others on 13 roads, involving 2 passenger and 15 freight and other trains.

Negligence in Operating.

10th, at South Terminal Station, Boston, a train of empty passenger cars being backed into the station ran off the end of the track and broke through the fence surrounding the concourse. It is said that the man in charge of the cars depended upon the air-brakes, but that the brake connections had not been coupled.

21st, 1 a. m., on Norfolk & Western, at Pisgah, Va., a westbound freight train drawn by two engines was derailed at a misplaced switch and both engines and one car were wrecked. One engineman and one fireman were killed.

23rd, on New York Central & Hudson River, near Chappaqua, N. Y., a work train was derailed, apparently by the overturning of a wrecking crane, and the caboose, in which were 25 laborers, was broken in two. Several of the men were slightly injured.

29th, 4 a. m., on Lehigh Valley, at Caledonia, N. Y., two oil tank cars on an eastbound freight train were crushed, when the train was too suddenly stopped on approaching a water tank, and were thrown across the westbound track. The wrecked cars were run into by a westbound passenger train and the passenger engine was ditched and wrecked. Six of the seven cars in the passenger train were derailed. The passenger engineman was injured.

And 5 others on 5 roads, involving 5 freight trains.

Unforeseen Obstructions.

25th, on Central of Georgia, near Ellaville, Ga., a mixed train, consisting of an engine, 12 freight and three passenger cars, was blown off the track by a cyclone. Four passengers were injured.

26th, 10 p. m., on Delaware, Lackawanna & Western, near Norwich, N. Y., a passenger train was derailed at a point where the roadbed had been undermined by a flood and the cars fell about 8 ft., though most of them remained in nearly an upright position. Most of the cars lodged in water about 8 ft. deep. One passenger was injured.

27th, 11 p. m., on Delaware, Lackawanna & Western, at Sherburne, N. Y., a wrecking train going to the relief of a passenger train was derailed at a culvert which had been weakened by a flood and the engine and two cars were submerged. The fireman was scalded.

And 4 others on 4 roads, involving 1 passenger train and 3 freight trains.

Unexplained.

11th, 2 a. m., on Yazoo & Mississippi Valley, near Percy, Miss., a passenger train was derailed and two cars were ditched. Seven passengers were injured.

15th, on Missouri, Kansas & Texas, near Dallas, Texas, a passenger train was derailed and several cars were ditched. Three passengers and one trainman were injured.

16th, on Delaware, Lackawanna & Western, at Portland, Pa., a passenger train was derailed by running into a side track at full speed and the engine was overturned. A brakeman in the front passenger car was injured and the fireman was slightly injured by jumping off. The engineman did not slacken his speed on approaching the sidetrack, although this point was a regular meeting place for this train; he was found dead in the cab after the collision and it is believed that he had died of heart disease some time before reaching Portland. Conductor Purple, on discovering that the engineman was approaching the switch too fast, applied the brakes by the valve in the passenger car and thereby reduced the speed slightly before the derailment. The fireman shouted to the engineman a moment before the collision but received no response.

17th, on Union Pacific, at Rock Springs, Wyo., mail train No. 101 was derailed and the first four cars were ditched. The locomotive ran off the track, but was re-railed and when it came to a stop it was on the track. None of the trainmen was injured.

17th, on Illinois Central, at Memphis, Tenn., a car in a freight train was derailed and the conductor was killed.

18th, on Chicago, Rock Island & Pacific, near Grand Junction, Iowa, passenger train No. 20 was derailed and the tender, two baggage and two mail cars were ditched. Twenty passengers were injured.

19th, on Central of Georgia, near Brandywine, Ga., a freight train was derailed at a trestle bridge; engineman and fireman killed, two other trainmen injured.

21st, on Chicago, Burlington & Quincy, near Vermont, Ill., a mixed train was derailed and the caboose and 9 freight cars were ditched. One passenger and one trainman were injured.

22nd, on Southern Pacific, near Tehachapi, Cal., a passenger train was derailed and the engine and first four cars were ditched. Several passengers were injured.

23rd, 10 p. m., on New York, New Haven & Hartford, near Manchester, Conn., a freight train was derailed and a tramp was injured.

25th, on Great Falls & Canada, near Steel, Mont., a passenger car was derailed while running at full speed and the two day cars fell down a bank. Five passengers were injured.

28th, on Louisville & Nashville, at West Pascagoula, Miss., a freight train was derailed and two cars were wrecked. The engineman and a brakeman were injured.

28th, on New York Central & Hudson River, at Depew, N. Y., a freight train was derailed and nine cars were ditched. A brakeman was killed and the fireman injured.

And 37 others on 30 roads, involving 1 passenger train and 36 freight and other trains.

OTHER ACCIDENTS.

13th, on Lehigh Valley, at Mud Run, Pa., the locomotive of a freight train was badly damaged by the explosion of its boiler, the boiler being blown clear of the frame and landing in the Lehigh River; engineman, fireman and one brakeman killed. The boiler as it exploded was thrown clear of the track and the train ran some distance before it was stopped, the wheels of the engine not being derailed.

16th, on Northern Pacific, near Olive, Mont., a private car in a passenger train carrying a theatrical party took fire and was partly burned up. Three passengers were burned to death and one died soon after from burns and injuries. The train was running at the time about 35 miles an hour and the cause of the fire was careless handling, by porter in charge, of fire in kitchen range.

17th, on Plant System, at Buffalo Bluff, Fla., two sleeping cars in passenger train No. 32 took fire and were completely burned up. The passengers had barely time to escape, some of them leaving their clothes behind.

30th, 5 a. m., on New York, Chicago & St. Louis, at Harbor Creek, Pa., the locomotive of passenger train No. 4 was badly damaged by the breaking of the pin of a driving wheel, and the engineman was injured.

And 2 others, involving 1 passenger train and 1 freight.

A summary will be found in another column.

The Status of the Nile Dam.

BY JOHN G. LONG, U. S. Consul-General at Cairo.

Of the many monuments of this country's past that line the banks of the Nile, none will be more enduring than the Assouan Dam. This great work will be a

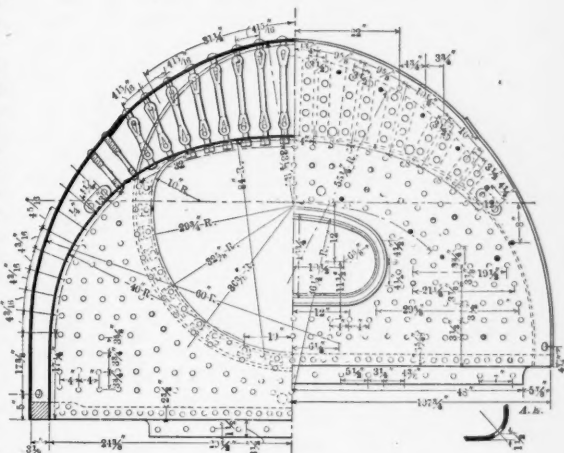
tion was the most difficult portion of the work; seven-eighths of it is now complete. The most important work now in hand is the construction of the dam across the western channel, the last of the five deep channels of the river which cross the line of the dam. All the foundation masonry will be in, and should be above water before the beginning of the Nile flood this year. When this has been accomplished, the difficult part of constructing the great dam will be over. It is now expected that the foundations of the west channel will be completed by the middle of next May.

As the dam will close the Nile to navigation, a canal of about 6,540 ft. in length is being constructed. There will be four locks, each 10.3 yds. broad and 87.2 yds. in length, the first gate to be about 21.8 yds. behind the center of the dam and the others north of it. The recess for the first lock gate has just been started, and the work of construction is now actively in progress. The foundations for the second and third locks are similarly in progress. The east wall of the first lock and the west wall of the second have already been built to the height of something more than 8.7 yds. The foundation of the first lock floor is at 98.1 yds. level, the others being respectively at 97, 93.7 and 90.4 yds. level. The canal will permit sailing vessels to pass all the year round; heretofore they could only get through the cataract during high Nile. The mail steamers and any stern-wheeler now on the Nile will also be enabled to pass. The cost of this canal will be approximately \$1,250,000, and would require from \$100,000 to \$125,000, in lock dues per annum, if it is ever to be a paying investment. But there is very little prospect of any immediate increase in trade; in fact, the reverse is probably the case. Although a great volume of trade passes Shellal now, the construction of a railroad from Assouan to No. VI station is only a matter of time, and the trade from the north of the dam will consequently be limited to the district between Assouan and Wady-Halfa, which will not be tapped by the railroad. The construction of this canal is, in fact, due to what may be styled "moral considerations." The Government does not wish to bar the navigation of the oldest water way in the world. In 1902 the work will be practically confined to finishing up. The great enterprise has gone too far or even a high Nile to hinder the completion of the dam.

No precise details can be given as to the cost of the work. The original estimate for the construction of the

Heavy Eight-Wheel Passenger Locomotive—Delaware, Lackawanna & Western.

The Schenectady Locomotive Works is building nine 8-wheel passenger locomotives for the Delaware, Lackawanna & Western which, for 8-wheel engines, are very



Fire-Box Views—D, L. & W. Engine No. 975.

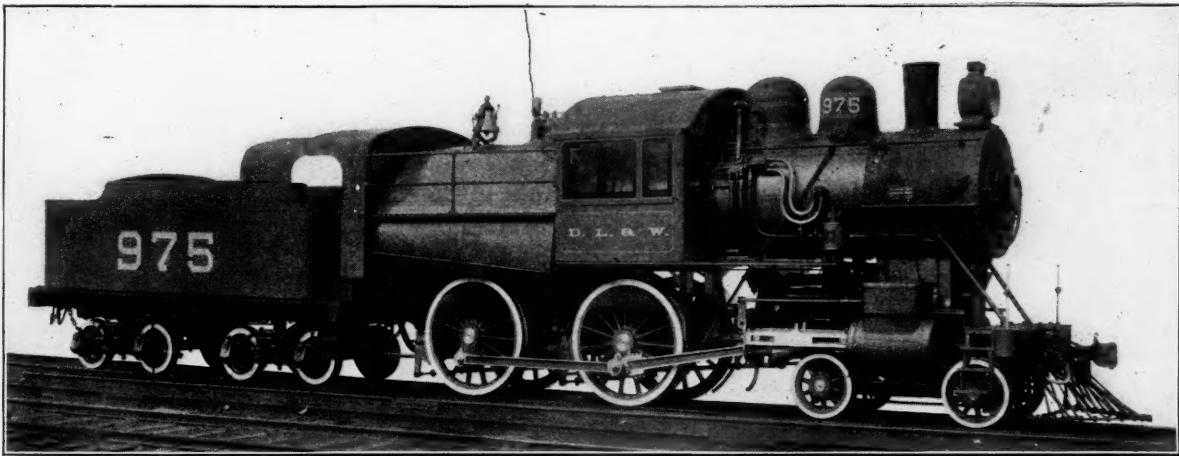
heavy, have exceptionally wide fire-boxes and an unusual amount of grate surface. The design is by Mr. T. S. Lloyd, Superintendent of Motive Power and Machinery, and the intention is to use very low-grade anthracite coal or culm. Engine No. 975, which is illustrated herewith from a photograph and line drawings, has been at work for some time in a satisfactory manner. In the *Railroad Gazette*, June 22, 1900, we described the heavy 10-wheel passenger locomotives of the Lackawanna, and a reference to that description will show that while these 8-wheel engines have cylinders 2 in. shorter, a total weight of 40,000 pounds less, and 556.7 square feet of heating surface less, the grate area of the eight-wheel engines exceeds that of the ten-wheel engines by three and one-half square feet. This different relation of grate surface and heating surface is based upon the experience of Mr. Lloyd in using inferior grades of anthracite and establishes a somewhat wider reserve area of fire surface.

The cylinders of the 8-wheel engines are 20 x 26 in.; the driving wheels have cast-steel centers and are 69 in. in diam. over tires; the driving wheel journals are 9 x 13 in., the main crank pin journals 6 x 6 in. and the side rod pin journals 4½ x 4 in. The weight on drivers is 93,000 lbs., and the total weight of engine in working order 139,000 lbs. The driving wheel base is 8 ft. 6 in. and the total wheel base is 8 ft. 3 in. Allen-Richardson balanced slide valves are used, the greatest travel being 5½ in., the outside lap ½ in., the inside clearance ¼ in. and the lead of valves in full gear forward 1-16 in.

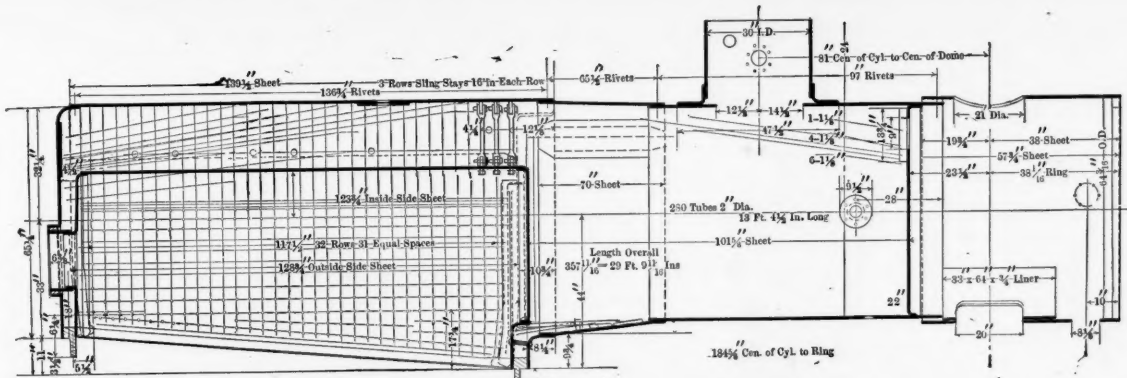
The boiler is of the straight top wide fire-box type, the outside diameter of the first ring being 61 in. and the working pressure 185 lbs. per sq. in. The material of the barrel and outside of fire-box is Coatesville steel of 19-32 in., ½ in., ¾ in. and 11-16 in. thickness. The fire-box is 126 in. long, 100 in. wide, 57 in. deep at front, and 46 in. deep at back, made of carbon fire-box steel. There are 280 charcoal iron, No. 12 B. W. G., tubes 2 in. in diam. and 160½ in. long. The total heating surface is 2,143.27 sq. ft., and the grate area 87.67 sq. ft. Rocking grates, in six sections, are used and the ash pan is D, L. & W. style, with cast-iron bottom.

The tender weighs 48,150 lbs. empty, has an underframe of 10 in. steel channels, and four-wheel, center-bearing D, L. & W. standard trucks with cast-steel bolsters. The water capacity is 5,000 gals.; coal, 10 tons. The engines are equipped with Westinghouse-American combined brakes on drivers, tender and for train, and have a 9½-in. air pump; Westinghouse air signal; H. W. Johns' asbestos sectional lagging on boiler and cylinders; Gold car heating apparatus; Sterlingworth brake-beams on tender; Leach sander, and Gollmar bell ringer.

Fourteen locomotives, in which it is intended to burn culm absolutely, without any admixture of clean fine anthracite, have just been completed for the Lackawanna by other locomotive builders, and of these engines it may be possible to say something later, as it seems inadvisable to confuse them with the design here illustrated.



Heavy Eight-Wheel Passenger Locomotive With Wide Fire-Box—Delaware, Lackawanna & Western.



Boiler of Lackawanna Engine No. 975 and Class.

memorial of the British sojourn in Egypt, and in boldness of design and thoroughness of execution will rank with anything that has ever been constructed in this land of Titanic achievements. The following sketch will give a fair idea of the progress and present state of the work:

All the low-level sluices have been practically completed. These will let the water through even when the Nile is low. There are altogether 180 sluices and 150 low-level sluices. The lowest level water ever reaches at Assouan is 278.89 ft. above the Mediterranean. By means of the dam, the water will be held up to 347.6 ft. above the same level. The lowest sluices are 65 in number, and they have been made recently. The foundation of the deep sluice goes 75 ft. below the ordinary rock surface. Each sluice is fitted with steel gates. The founda-

two reservoirs at Assouan and Assiout was \$9,886,000. The excess over this estimate will be great, although it cannot be accurately gaged at present, owing to the greatly increased depths which had to be excavated before sufficiently sound granite on which to found the dam was reached. The whole work will be finished at least a year before the time specified in the contract, which was five years. This will save one low Nile, and this early completion of the dam will, therefore, be of great utility and benefit to Egypt.

On the Saxon railroads one passenger out of 387 travels first class.



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EDITORIAL ANNOUNCEMENTS.

CONTRIBUTIONS—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

ADVERTISEMENTS—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and these only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.

There is something imposing in big figures, much more so than in an assemblage of many small ones. The Siberian Railroad, which, with branches, will be something like 5,000 miles long, is called an undertaking of unparalleled magnitude. Mr. Henry Norman, in an article in *Scribner's Magazine*, says "that Russia, single-handed, should have conceived it and carried it out, makes imagination falter before her future influence on the course of events." But this railroad was begun in 1891, and certainly will not be finished next year. Now the United States, in the ten years beginning in 1880, built 73,400 miles of railroad, or more than 14 times as much as the Siberian Railroad. More than once in a single year we have built railroad twice the length of the Siberian, and we had not then half the population of Russia. Russia itself has built a great deal more railroad in Europe than in Asia since it began work on the Siberian Railroad. The latter is certainly a great undertaking, and very much greater for Russia than it would have been for us, for we are economically very strong and she is weak. What makes the Siberian Railroad notable, however, is not so much its length as the fact that it makes accessible for development an enormous territory heretofore almost wholly undeveloped.

Concerning Exposition Rates.

The coming of the Pan-American Exposition brings up again the old question of reduced passenger rates. The rate-making officers are meeting in all parts of the country, and, as of old, taking every occasion that will tempt people to travel in masses as an occasion to "put in" special low rates. Thus, we read that the Transcontinental Passenger Association makes the fare from the Pacific coast and back, for the Cleveland encampment of the Grand Army of the Republic, one fare for the round trip, the return tickets to be good a month. To Buffalo the universal rate offered to Californians is to be for the round trip, one fare plus \$1. This very low basis (half fare) is not to prevail from New York to Buffalo if the more intelligent passenger men can keep control. So far they are able to hold up to a little more than one fare and a half for 10-day tickets and a little more than one fare for round trip day coach excursions. Probably it is useless to reason against the unnecessary and irrational reductions of rates which will be common through the summer, but at least we may once more express certain opinions which, if they are correct, will prevail, as men grow wiser, and if they are incorrect are not likely to do any harm.

To begin with, let us clear our minds of certain false sentiments which are commonly held by the public and frequently by railroad men. There is no question of moral obligation in the matter. The

railroads are not called on as a public duty to promote attendance at the fair or, by low rates, to induce saengerbunds and school teachers' societies to go and spend their small savings in Buffalo. The merchants and hotel keepers of that town have no such illusion concerning their own duty to society. In fact, it would be distinctly immoral for the administrative officers of the railroads to base their exposition rates on the theory that they should sacrifice any net earnings at all to get people to go to the fair. They cannot be sure that a large attendance there would add to the civilization, the wealth or the piety of the nation. Indeed, they can be reasonably certain that many people will suffer in pocket and in morals by going there. A pretty good argument could be made that the nation would be richer and more orderly if people all stayed home next summer and worked their farms, and made shoes, and spent their money on their local churches and schools and libraries and roads. There are many wise men who think that the Chicago Exposition was a great misfortune for that city, and doubt its benefit to the nation. However all that may be, the responsible officers of the railroads have no right to use the properties entrusted to their care for questionable social experiments. Their duty is to make these properties earn net revenue; and fortunately they know that working along that line they increase the wealth of the nation and serve the comfort and convenience of the people.

Having arrived at this point we have only to try to find the exposition rates that will yield the greatest net revenue. We know that if there is some special fact which tempts many people to travel, earnings may be increased by reducing rates. We know also that there is a limit to this. The duty is to find that limit; this must be a matter of judgment based on past experience.

Given a great attraction like the Buffalo fair, many people would travel at regular rates, and a reduced excursion ticket, good on regular trains, would diminish the earnings that might be got from those people. But many will be tempted to move if they can save a few dollars in railroad fares, and probably something will be gained, on the whole, by such excursion tickets, if the reduction is not great.

Again, there are large numbers of people who will endure the various inconveniences of special "day coach" excursions if the fare is low enough, but who would not travel at all at or near the regular rates. The experience of 1893 shows pretty certainly that money may be made by stimulating this class of travel. But there is danger of making the special excursion trains so cheap that people will go by them who would otherwise pay the higher fare to travel by the regular trains, and thus revenue would be lost.

Still further, there are to be 200 or 250 special conventions in and near Buffalo this summer. To these many people would go at regular rates, and more at some reduced rate. To make a rate as low as one fare for the round trip, for these conventions, is throwing away money. If 75 people will go at two fares, or 100 at one-and-one-half fare, why go to the expense of moving 150 people at one fare to earn the same money? The net from the 75 people will be more than from the 100, and from the 100 more than from the 150, and those who travel will be happier and safer, the whole railroad staff will be more comfortable, and the regular business of the road will be less interfered with. This last is a very important point, often overlooked because it is not conspicuous. It is hard to see why the regular freight and passenger revenues should be diminished and why regular shippers, consumers and travelers should be incommoded because the Elks or the Buffalos want to make a big cheap excursion.

In brief, if there is an unusual demand for the commodity which you have to sell you usually put up the price, as is quite proper. No doubt the hotel keepers, the tradesmen and the lodging house keepers of Buffalo and of the surrounding towns, as well as the alleged Indians at Niagara Falls, will all raise the price of their wares with the abnormal demand for them. The railroads alone will lower their prices, and, unfortunately, they seem disposed to make the reductions in the same crude, unscientific way that has been followed in the past. We repeat that the only proper rule, the only moral rule, is to reduce to the line of maximum net revenue, and stop there.

There is still a point on which we have not touched. We have alluded to the right of the great mass of the citizens who do not go to the fair to have their regular service—freight and passenger—

undisturbed. But we have not spoken of the increased danger of accidents with the movement of a great number of excursion trains. Some of us remember (all railroad men ought to remember) the accidents of the late summer and autumn of 1893. That was a season of disgrace and humiliation, as well as money loss, to more than one American railroad. It brought sorrow to many households. There are some passenger officers who thoroughly appreciate this serious side of the matter, and who understand all that we have been saying about the difference between volume of movement and net revenue. But there are many who do not understand these things; for the actions of those gentlemen the general managers or vice-presidents in charge of traffic, or other higher officers, will have to take the immediate responsibility or their properties will suffer.

March Accidents.

Our record of train accidents in March, given in this number, includes 78 collisions, 87 derailments and 6 other accidents, a total of 171 accidents, in which 41 persons were killed and 139 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

	Collisions.		Crossing and		
	Rear.	Butting.	other.	Total.	
Trains breaking in two.....	7	0	0	7	
Misplaced switch.....	0	2	5	7	
Failure to give or observe signal. 3	2	2	1	6	
Mistake in giving or understand- ing orders	0	5	0	5	
Miscellaneous	5	0	3	8	
Unexplained	13	13	19	45	
Totals	28	22	28	78	

Derailments.

Broken rail.....	1	Bad loading.....	1
Loose or spread rail.....	1	Too quick application of	1
Defective frog.....	2	air-brakes.....	1
Broken wheel.....	4	Landslide.....	3
Broken axle.....	6	Washout.....	2
Broken truck.....	4	Snow.....	1
Brake hose burst.....	1	Wind.....	1
Failure of draw-bar.....	1	Unexplained.....	50
Broken connecting rod.....	1		
Misplaced switch.....	4	Total.....	87
Bad switching.....	3		

Other Accidents.

Boiler explosion.....	1
Broken side rod.....	1
Cars burned while running.....	3
Breakages of rolling stock.....	1
	6

Total number of accidents..... 171

A general classification shows:

	Col- lisions.	Derail- ments.	Other acc'd'ts.	Total.	P. c.
Defects of road.....	0	4	0	4	3
Defects of equipment.....	7	17	3	27	17
Negligence in operating.....	26	9	3	38	22
Unforeseen obstructions.....	0	7	0	7	4
Unexplained.....	45	50	0	95	54
Totals.....	78	87	6	171	100

The casualties may be divided as follows:

	Collisions.	Derail- ments.	Other acc'd'ts.	Total.
Killed:				
Employees.....	23	7	3	33
Passengers.....	3	0	4	7
Others.....	1	0	0	1
Totals.....	27	7	7	41
Injured:				
Employees.....	62	21	1	84
Passengers.....	5	48	0	53
Others.....	1	1	0	2
Totals.....	68	70	1	139

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. killed.	Pass. in- jured.	Emp. killed.	Emp. in- jured.
Defects of road.....	0	11	0	0
Defects of equipment.....	0	0	4	1
Negligence in operating.....	7	5	25	66
Unforeseen obstructions and maliciousness.....	0	5	0	1
Unexplained.....	0	32	4	16
Totals.....	7	53	33	84

Twenty-four accidents caused the death of one or more persons each, and 39 caused injury but not death, leaving 108 (63 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with March of the previous five years shows:

	1901.	1900.	1899.	1898.	1897.	1896.
Collisions.....	78	82	47	66	49	57
Derailments.....	87	116	55	98	71	72
Other accidents.....	6	6	3	8	3	5
Total accidents.....	171	204	105	172	123	134
Employees killed.....	33	28	31	15	32	18
Others killed.....	84	61	72	92	47	49
Employees injured.....	55	107	72	36	39	46
Average per day:						
Accidents.....	5.51	6.58	3.39	5.55	3.97	4.32
Killed.....	1.32	1.19	1.16	0.61	0.29	0.90
Injured.....	4.48	5.42	4.65	4.13	2.77	3.06
Average per accident:						
Killed.....	0.24	0.18	0.34	0.11	0.33	0.21
Injured.....	0.81	0.82	1.37	0.74	0.70	0.71

The train accident most fatal to passengers in March was neither a collision nor a derailment; it was a fire in a car, near Olive, Mont. We have classed the fatalities in this case under the head of negligence in operating, though it appears from the accounts that the negligence is not attributable to an employee of the railroad com-

pany. There was a similar case of fire in Florida, almost at the same time, but no personal injuries were reported in that case. The other two cases of passengers fatally injured are found at Arlington Heights, Ill., and at Rust, Ark.

The other most prominent passenger train accidents are those at Portland, Pa., on the 16th; Grand Junction, Ia., on the 18th; Johnson, Neb., on the 19th, and Terre Haute, Ind., on the 20th. The Johnson collision should constitute a "loud call" for the block system; that at Terre Haute was a fine illustration of the strength and safety of vestibuled trains.

The freight train collision at Schaghticoke, N. Y., on the 28th, illustrates a point which we had occasion to mention a few weeks ago, the danger of running past signals in consequence of the sleepiness of an engineman; and it also illustrates the difficulty of proving exactly what the trouble is in a case of that kind. At the inquest on deaths of the men killed in this collision a brakeman testified that the negligent engineman had been found asleep a few miles back while the train was moving slowly up grade. This, of course, was no proof that the man was asleep at the time of the collision, but it would be considered by most jurymen as presumptive evidence to that effect. Two freight train collisions, those at Lenoir City, Tenn., and at Trout Brook, N. Y., increase the long list of cases due to lack of care in reading orders; and the last named case has the additional feature that the engineman also disregarded what was practically a distant signal at the approach to the meeting point.

The wreck at Glen Gardner, N. J., on the 24th, emphasizing the need of air-brakes on the whole of a train if they are to be used on a part of it, has already been reported in our editorial columns. There is another disaster due to burning oil in the present record, that at Buffalo, N. Y., on the 9th.

The number of street car accidents reported in the newspapers in March was 13, in which one person was killed and 46 were injured. The list of causes includes the usual variety; also one case where an electric car was deprived of its power while on a railroad crossing, and consequently was wrecked, and one explosion of a compressed air car in New York city. Both of these cars were practically empty at the moment of the accident, so that no passengers or employees were injured. One bystander was injured in the air car explosion.

Annual Reports.

Lake Shore & Michigan Southern.—The thirty-first annual report of this company is for the year ending Dec. 31, 1900, a remarkably prosperous year. On an average operated mileage of 1,411.3 miles the gross earnings amounted to \$26,466,514, having increased 12.08 per cent. over the preceding year. The net earnings were \$9,158,719, having increased 17½ per cent. Particulars are given in the table below by which it will be seen that the increase of freight earnings was 13½ per cent. and of passenger earnings 11 per cent.

	1900.	1899.
From freight	\$18,317,427	\$16,115,690
From passengers	5,382,787	4,849,129
From mails, express, etc.	2,766,300	2,649,127
Total	\$26,466,514	\$23,613,946
Operating expenses and taxes ..	17,307,795	15,832,145
Per cent.	(65.40)	(67.03)
Net earnings	\$9,158,719	\$7,781,802
Increase in gross earnings		12.08 %
Increase in operating expenses and taxes	1,475,651	9.32 %
Increase in net earnings	1,376,917	17.69 %

In freight the ton-miles increased, as did the rate, the former 6.03 per cent. and the rate 7.22 per cent. Notwithstanding the increase, however, the rate cannot yet be called large, having been 0.505 cent per ton-mile. The freight business was evidently handled more economically, the loaded car mileage having increased with a decrease of freight train miles. The average trainload of revenue freight was 454.7 tons and of all freight 470.6 tons. The revenue trainload increased 6.41 per cent. The passenger mileage increased 13.43 per cent., but the rate fell 2.4 per cent., having been 2.03 cents per passenger-mile.

It will be observed that there was an increase of \$1,476,000, or 9.32 per cent., in operating expenses and taxes. The operating expenses included extraordinary expenditures as follows: \$2,267,825 for new equipment and \$804,174 for new side tracks, construction and betterments, the heaviest single item there having been \$264,000 for second track. Exclusive of this expenditure for new work the increase for maintenance of way and structures was practically nothing. In maintenance of equipment there was a decrease of \$121,805. This was accounted for by a decrease of \$196,200 in repairs to locomotives, car repairs having increased somewhat.

The report informs us that during the year 1901 a large outlay will be necessary for new work, including bridges, buildings, second track and separation of grades. There is no mention in the report of any assignment from surplus for those purposes, but presumably there will be some cash available.

After paying interest and rentals, etc., the surplus earnings amounted to \$6,658,430, or \$13.46 per share of stock. Out of this 7 per cent. dividends were paid, amounting to \$3,462,655, the remainder having been passed to surplus in income account.

During the year stock in two important connecting lines was bought, namely, the Lake Erie & Western and the

Cleveland, Cincinnati, Chicago & St. Louis. The cost of these securities was \$12,958,082, of which the amount of \$6,958,082 was paid out of the surplus earnings of this and preceding years.

The introductory pages of the report continue to bear the instructive statements that construction and equipment accounts still stand at \$84,000,000, as they have stood since 1883, and the capital stock at \$50,000,000, unchanged since 1871. During the year, however, the refunding went on, the exchange of 3½ per cent. gold bonds for old 7 per cent. bonds, having covered the balance of consolidated first mortgage and a part of the consolidated second general mortgage. Thus far \$36,551,000 of the old 7 per cent. bonds have been retired. While the outstanding bonds have increased in amount \$6,209,000 the interest charge has been reduced \$1,061,970.

The New York Central passenger department has added to the already long list of its publications a "Census Booklet," which differs from many of the folders by which railroads endeavor to announce widely their transcendent merits by containing matter which those who value such information at all are likely to preserve for the next ten years. For this "booklet" gives an alphabetical list of all towns in the United States which, by the census of 1900, had a population of 8,000 or more, with their population in 1890, as well as in 1900. The special New York Central feature of this list is that towns on lines of that company, and lines most intimately connected with it, have their 1900 population given in a separate column, and in full-faced type, which brings out the notable fact that, of the total urban population in the United States in towns of more than 8,000 inhabitants, a little more than one-half is in towns on those lines. Most of these towns certainly are accessible not only by the New York Central but by other railroads; but it remains true that the Central has an extraordinarily large population on its lines, unequalled by any other in the country. Between New York and Buffalo, for instance, compared with the Erie (omitting the common points, New York, Jersey City, Hoboken, Newburg, Rochester, Batavia and Buffalo) the Central has 20 towns of more than 8,000 inhabitants, with an aggregate of 662,837, while the Erie has eight such towns with 490,239 inhabitants. To be sure, this difference is insignificant when we consider that the population of the common points on the two systems within these limits is 4,271,574. The folder also makes a striking exhibit of the location of the urban population by means of a map on which such towns, and only such, are given. A publication of this kind is particularly useful for editors; but whether it is wise for a railroad company to keep itself fresh in the memory of this class of the community we shall leave for the consideration of those gentlemen who read the applications for passes.

The Chicago, Burlington & Quincy is commonly regarded as peculiarly a carrier of produce to Chicago. It certainly is one of the chief arteries of that city; but it also plays no insignificant part in the commerce of St. Louis. Of the 25,406,000 bushels of corn brought to the latter city in 1900, the Burlington carried considerably more than half—13,717,000 bushels. It also supplied more than half the oats received there. In wheat it did not make much of a figure, bringing little more than 10 per cent., while the Missouri Pacific and the Wabash lines west of the Mississippi brought 47 per cent., and the Missouri, Kansas & Texas 11 per cent. The Burlington was the largest carrier of provisions to St. Louis, and brought more than an eighth of the hogs, but not much other live stock. The Missouri, Kansas & Texas led in cattle, with 25 per cent. of the total receipts, followed by the St. Louis & San Francisco with 18 per cent., the Missouri Pacific with 13½, and the Iron Mountain with 12½. Of the cotton, 42 per cent. came by the Iron Mountain, 28 by the Missouri, Kansas & Texas, and 10½ by the St. Louis & San Francisco. There were no produce receipts of importance by river, and the chief shipments by that route were 2,872,000 bushels of corn—about one-seventh of the total corn shipments. The aggregate tons received and shipped from St. Louis for two years are reported as follows:

	1900.	1899.	Increase.	Per cent.
By rail	15,375,441	14,805,872	569,569	4.0
Receipts	1900.	1899.		
By river	512,010	466,610	45,400	9.7
Shipments				
By rail	9,180,309	8,256,393	923,916	11.2
By river	245,580	203,205	42,375	20.8

If any one is disappointed because of the total increase in shipments the river took, only about one ton out of 23, let him be consoled by the fact that the percentage of increase was greater by river than by rail.

We have been told often of the wonderful progress made in facilitating transportation by rail, but notwithstanding all that has been accomplished, the art of transferring goods and passengers is still far behind the art of transferring the ownership of the railroads which carry them. In the week ending with Saturday, April 26, there were bought and sold on the New York Stock Exchange 1,419,390 shares of the common stock of the Union Pacific Railroad Company, while the total amount issued is 959,915 shares. Thus the ownership changed hands one and a half times in a single week. It is true that besides the common stock there are 995,001 shares of preferred, and of that "only" 185,510, or less than one-fifth, changed hands in that week.

NEW PUBLICATIONS.

Public Water Supplies. Requirements, Resources, and the Construction of Works. By F. E. Turneaure, C. E., Professor of Bridge and Sanitary Engineering, University of Wisconsin, and H. L. Russell, Ph. D., Professor of Bacteriology, University of Wisconsin. With a chapter on Pumping Machinery, by D. W. Mead, C. E., M. Am. Soc. C. E. Svo. xiv. + 746 pp. 231 figures. Index. New York: John Wiley & Sons, London: Chapman & Hall, Limited. 1901. Price, \$5.00.

This book was written primarily for students, but it will be found useful also to practitioners, for reasons to be mentioned later. The underlying idea in its preparation was to state and develop principles, rather than to give details of practice—a very proper idea considering the chief use for which the book was written. But many actual examples of practice are given to illustrate the principles, and there is an uncommon number of tables of data from recorded facts. There are also analyses of specific problems and short descriptions of actual investigations and of works built, which enable the reader to refer further to these concrete instances. But one of the best features of the book, one which will make it of especial value to old as well as young readers, is the list of references, at the end of each chapter, to the best literature on the topic treated in that chapter. These references cover books, monographs, society transactions and articles in those journals which treat especially of water-works and water supply. But we must repeat that the reader is not left to refer to other writings for specific information. The chapter on water consumption, for example, contains a body of facts and analyses such as we have not seen brought together in any other book. The author avails himself of the latest data, for instance, the excellent report of Mr. Freeman to the Comptroller of New York, and the report of the Engineers' Committee to the Merchants' Association of that city, both made in 1900.

It is not practicable to print here the whole of the analytical table of contents, which fills 10 octavo pages; but a notion of the scope of the work may be had from the principal chapter headings, which follow:

Introduction (Historical Sketch, Value and Importance of a Public Water Supply); Quantity of Water Required; Sources of Supply; The Rainfall; Evaporation and Percolation; (Evaporation from Water Surfaces; Percolation and Evaporation from Land Surfaces); Flow of Streams; Ground Water; Examination of Water Supplies; Quality of Water; Communicable Diseases and Water Supplies; Water Works Construction; Hydraulics; River and Lake Intakes; Works for the Collection of Ground Water; Impounding Reservoirs; Earthen Dams; Masonry Dams; Timber Dams; Steel Dams; Loose Rock Dams; Objects and Methods of Purification; Sedimentation; Sand Filtration; Mechanical Filtration; Miscellaneous Purification Processes; Pipes for Conveying Water; Conduits and Pipe Lines; Pumping Machinery; Distributing and Equalizing Reservoirs; the Distributing System; Operation and Maintenance.

American Street Railway Investments. Published annually. Quarto, 300 pages, with maps. New York: The Street Railway Publishing Company. 1901. \$5.

The 1901 edition of American Street Railway Investments (a supplement to the *Street Railway Journal*) has just appeared and is said to have been revised with great care to April 1. It gives the reports of all the street railroad companies of the United States and Canada, covering briefly history, financial situation, description of securities, plant and equipment, names of officers and financial results of operation. For many of the companies comparisons of operating results are made for four or five years. Obviously, the short histories to be at all complete must cover the details of the recent numerous consolidations. Tables are given comparing gross receipts for 1900 with those for 1899 of all companies receiving \$25,000 or more. These receipts aggregate about \$150,000,000 and there is an average increase of 10 per cent. for the year. The volume is a complete and useful manual of the great new interest which it represents.

The Inventor's Manual; How to Work a Patent to Make it Pay. By an Inventor. New and enlarged edition, 116 pages; small 12mo, index. New York: Norman W. Henley & Co. 1901. \$1.

The author says that the object of this book is to give the inventor and patentee some hints on patents generally, together with information on ways of exhibiting inventions, bringing them to public notice and effecting sales. Among the subjects treated in this work are: How to Invent, How to Secure a Good Patent, Value of Good Invention, How to Exhibit an Invention, How to Interest Capital, How to Estimate the Value of a Patent, Value of Design Patents, Value of Foreign Patents, Value of Small Inventions, Advice on Selling Patents, Advice on the Formation of Stock Companies, Advice on the Formation of Limited Liability Companies, Advice on Disposing of Old Patents, Advice as to Patent Attorneys, Advice as to Selling Agents, Forms of Assignments, License and Contracts, State Laws Concerning Patent Rights. Obviously, to treat so many subjects and such important subjects in 116 small pages, in large type, is a little difficult; in fact, the treatment must be superficial. Nevertheless the writer has contrived to bring together many facts and opinions with which inventors ought to be familiar. They could save themselves waste of energy and money if they would carefully read this little volume.

The New Shops of the Central Railroad of New Jersey.

In December last the Central Railroad of New Jersey broke ground for the long-talked-of new shops. The site is the upland and meadow opposite the Elizabethport station, extending in a northerly direction along the line of the Newark Branch for about half a mile, and easterly along the main line to Newark Bay. The plant is to be complete, including a large coaling and water station, and a 50-stall roundhouse, which will be provided with drop pits and an electrically driven turn-table. Next to the roundhouse will be the oil and waste house; the system to be adopted for distributing the oil being by compressed air. In front of the roundhouse will be a transfer table 80 ft. wide with a present length of about 400 ft. This will deliver engines and cars to the large erecting shop, paint shops and passenger repair shop. The erecting shop runs parallel with the main line track; this with the boiler and machine shop form a building some 700 ft. long x 153 ft. wide. The erecting shop will be provided with electric cranes and drop pits.

Adjacent to the erecting shop will be the machine shop bays. The first bay is to be used for heavy tools; this will be provided with electric cranes. The second bay will be used for the smaller machine tools which will be served by air lifts. The plant will also be provided with a riveting tower 70 ft. high. Parallel to the erecting shop, and about 100 ft. distant, will be a blacksmith shop 83 ft. x 300 ft. A storehouse 50 x 300 ft. will also be built; over this a second story 50 x 150 ft. will be used for the offices of the shops. The storehouse will be fireproof and of concrete steel construction. The powerhouse will also be of this construction, and in it will be installed the engines, electric generators and air compressors. The boiler house will adjoin the power house, and will have cold storage spaces running through its entire length. Babcock & Wilcox boilers will be used. Mr. George Hill, of New York city, is the designer and engineer for this work. The grading and part of the foundations, which are of concrete, are now finished, and work is being started on the steel framing.

Brake Gear Designed in 1879 and 1881.

We are informed that claims are made against railroads throughout the country for royalty on the usual arrangement of equalized brake levers as used on passenger and freight cars, these claims being based on a patent issued March, 1883, to S. P. Weller, S. Wanee and G. Roesch. As bearing upon this matter we publish certain designs for brake gear which were made and used before the date of this patent.

Fig. 1 shows an arrangement of brake levers designed Feb. 3, 1879, by Mr. W. L. Austin, of the Baldwin Locomotive Works. This was used under locomotive tenders

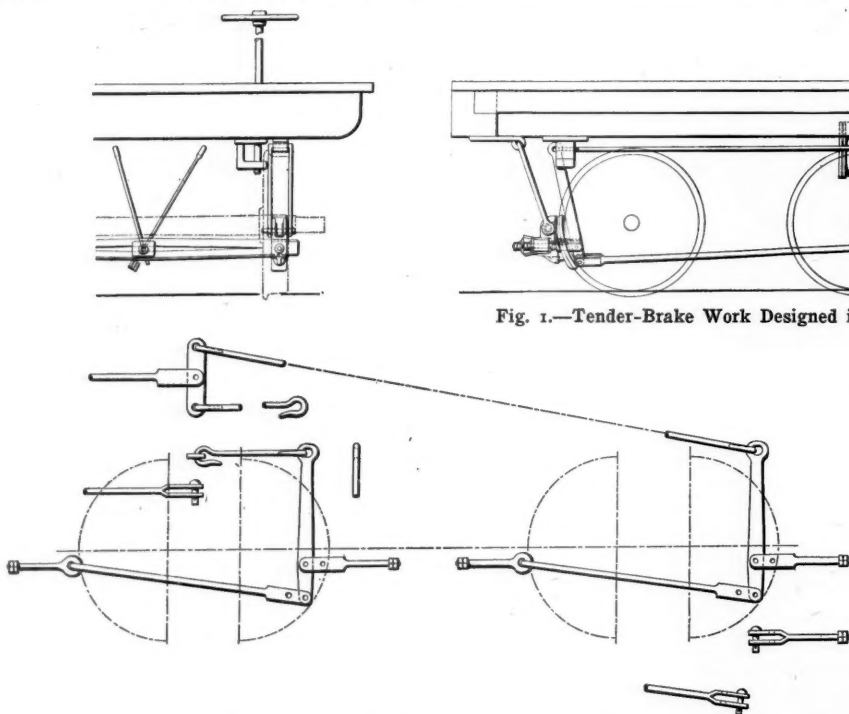


Fig. 2.—Tender-Brake Work Designed in 1881.

built at the Works that year. Fig. 2 shows an arrangement of brake levers designed Nov. 21, 1881, and used under locomotive tenders built in that year. The arrangements are perfectly obvious from the engravings, and it may be of interest and use to railroad companies to see them, in view of the claims now being made.

Since the trials of American couplers in Germany, begun some months ago, the matter of introducing automatic couplings gradually throughout the German Railroad Union is seriously contemplated. The Prussian Minister of Public Works has approved of the introduction of American couplers on some narrow-gauge roads, and the application of Gould couplers and of a German

design on a few cars for trial on a standard-gage system. The position of the draw-head is to be discussed by a committee of the Union.

The Largest Steel Grain Elevator.

The Great Northern is finishing a steel terminal grain elevator at the head of Lake Superior, which is described and illustrated in *Iron Age* of April 25. It is so built that 18 cars, or nine on each track, can be unloaded at one time. Cables haul trains of nine cars into the house and place the cars above concrete hoppers, into which descend the belts carrying the elevating buckets. These hoppers are each 20 ft. wide to catch the grain from both tracks, and each is 34 ft. long, so that the nine form almost a continuous hopper the length of the house. Running on tracks attached to brackets in the walls are automatic shovels for unloading, which are so arranged that they can be spotted directly to the front of each car door. An endless belt carrying small buckets, runs through the bottom of the hoppers and carries the grain to the top of the house, where it falls into the garners, whence it falls into the scale hoppers and thence into the scales. From these it drops through a swinging turnhead into any of the spouts and is conducted, perhaps to a belt conveyor by which it is handled longitudinally of the building, perhaps via another series of turnheads and spouts to its bin. If it is to be cleaned it falls through the bin to one of the cleaning legs that elevate it, and passes over the sieves of the cleaning machines on the ground floor, whence it returns again to the top of the house and down into a bin. The shipping bins on the water side of the house have capacity enough to load a ship of 160,000 bu. at one draft. The grain is weighed a second time before being sent to the shipping bins.

The elevator, which is the biggest one in existence, has many distinctive features that mark it as different from anything yet built. It has 607 square steel bins 85 ft. high, with hopper bottoms of steel plate, rectangular

which has room for 1,200 cars. Two tracks run through the house and at the end of the yard is a single-track 80-ft. transfer table feeding 12 tracks. The yard for the elevator has room for 160 cars. The elevator is set upon 4,600 piles, each 40 to 50 ft. long, 14 in. through, driven to refusal. The elevator will hold 3,100,000 bu. and will receive from 500 to 600 carloads a day, an average car holding 800 bu. of wheat. It will grade, scalp and clean 12,200 bu. per hour. It will ship 300,000 bu. a day with its 16 marine spouts. The extreme length of the structure is 367.33 ft. Its width is 124.33 ft. and it is 251.5 ft. high. The building is planned so that additional steel tank storage can be placed alongside for 3,000,000 bu. more, all to be operated from the present machinery. The power distribution is all electric, generated in an outside building. The contract for this elevator was let to the Ritter-Conley Manufacturing Co., of Pittsburgh. The steel was erected by the Kelley-Atkinson Construction Co., of Chicago. The scales were furnished by the Standard Scale Co. of Pittsburgh, and the electrical appliances and machinery by the Westinghouse Electric & Manufacturing Co. The design of the elevator was largely the work of Mr. A. D. Bellinger, Superintendent.

A Railroad Statesman.

In a recent issue of the *London Times* is a very appreciative letter, from Mr. Acworth, about the late Mr. C. P. Clark. Mr. Acworth points out certain facts which have not been mentioned in such notices of Mr. Clark's work as we have seen:

"To-day the Consolidated Road holds what is probably the most absolute and unassailable monopoly in existence. And yet the public and the traders are not dissatisfied, and the company is on excellent terms both with the connecting railroads and with the Legislatures and Railroad Commissions of the States through which it passes. The numerous companies taken over have been acquired at prices which were fair and satisfactory to their shareholders; and, whoever may have profited by the various

transactions, at least every one knew that not one dollar found its way into the pocket of the prime mover in each and all of them. The shareholders in the old New Haven Road got 10 per cent. for their money, a precarious income depending on the making of a large profit on a small business. That dividend was continued till 1895, when the President made the acute depression of trade then existing in America the pretext—it was not the reason—for reducing the dividend to 8 per cent. Eight per cent., he said privately, was as high a dividend as could be reasonably be asked for nowadays, and beyond 8 per cent. the dividend should not again be raised, if he could help it—nor has it been so far. But the 8 per cent. dividend of the Consolidated Road is about as safe as anything in this world, for not only is it secured on an enormous and stable business, but it is very much less than the property actually earns. Your article mentions the vast reconstructions and improvements all over the system, and these have been carried out in great measure at the expense of revenue. "Ploughing the surplus into the road" was a favorite phrase of Mr. Clark's. Coming home from a holiday, a few days before the annual meeting of his company, and finding an inconveniently large balance had accumulated to the credit of net revenue, he promptly ordered 50 new locomotives, and, though their construction could not even be commenced within the period, charged their entire cost in the accounts for the expiring year. One of his leading principles was never to increase debt, a doctrine even more revolutionary in America, where the bonded interest is often enough to absorb the whole net revenue, than it would be here. Whatever new capital he raised was raised by the issue of ordinary shares. "If hereafter," he once told me, "the line only earns \$1 net profit, at least my shareholders will get the whole of it among them." To wisely conservative man-

agement like this the shareholders of the New Haven Road owe it that their substantial dividends are absolutely secure for an indefinite future, while the public must ere long see their account in lower rates or better and more expensive service or both combined. Though the doctrine is perhaps old-fashioned nowadays, some of us think that the best public service is obtained from railroads that have to live and earn their dividends in face of competition. But, be that as it may, the career of Mr. Clark is sufficient proof that the public may be well served and contented under a system of absolute monopoly, provided the monopoly is controlled by a man as absolutely honest, as wise and farseeing, as enlightened and public-spirited as was the late President of the Consolidated Road."

Openings for Mechanics in the Philippines.

Cotton mill enterprises have been stimulated by the fact that the military authorities have ordered all natives who formerly wore only the breech cloth to get into clothes. Capitalists intend to erect cotton mills at Manila, Iloilo and one or two other points, and a number of soldiers who formerly were employed by cotton machinery builders in the United States have secured service with the new concerns. Several mills are in process of construction. Just as soon as the machinery begins to arrive, the demand will begin for American machinists to set it up and instruct the natives how to operate it.

Another opening for American machinists is in the oil mills which are being established. Capitalists are planning to secure the oil products from the natural oil wells of the mountains and also to establish plants for making oils from the coconut and the fats of the caribou. There are shoe manufacturing machines already part way across the ocean, and there will be some openings for men who are familiar with these.

The immense profits derived by the owners of the ice-making machines of these islands is encouraging capitalists to take hold of this matter. At present the only reliable and effective supplies of ice are obtained from the ice-making machines connected with the hospitals at Manila and in Iloilo, and as much ice as can be spared is sold. Enterprising parties propose to establish plants in Manila and Iloilo with branches in about 50 of the leading cities and towns of the various islands.

Domestic engineers and others familiar with the installing of piping systems in houses, mills and other places are also in request for the reason that some of the recent shipments of articles to these islands have included large quantities of lead and other metal pipes and fixings for plumbing buildings. Heretofore no pipes whatever were in use.

There are few railroads in the islands at present, and these are narrow gage, imperfect and wretched. The public, however, is obliged to use the cars, as there are no other means of transportation, and every car that is pulled out of Manila on the little broken-down road in operation there is overloaded, and many would-be passengers have to wait for the next train for want of standing room. There is a road built by the Spanish at Santa Barbara on the island of Panay. There are other little roads in operation for carrying both passengers and ores from the mines in the hills, but all of them are in bad repair. Railroad machinists and engineers will find a field in the Philippines during the next few years, and the opening will occur shortly. G. D. R.

TECHNICAL.

Manufacturing and Business.

The office of C. H. Boaz, Vice-President of the Sterlingworth Railway Supply Co., has been removed from Room 1401 to Room 1200, Home Life Building, No. 256 Broadway, New York City.

P. H. Wilhelm, who has been representing during the past three years the Railroad Supply Company, of Chicago, in the Southern States, with headquarters at Atlanta, Ga., has been appointed Southern Agent of the American Signal Co., of Baltimore, Md., in the same territory.

A locomotive built by the Schenectady Works for the Pan-American Exposition, has been equipped with an improved Michigan triple locomotive lubricator and automatic steam chest plugs. The engine is to be turned over to the Michigan Central Railroad after the Exposition. Ten similar engines, by the same builders, for this road, have also been equipped with Michigan triple lubricators.

William W. Turlay has resigned as Secretary of The Steel Tired Wheel Co., New York, to take effect May 15. Mr. Turlay has been engaged in the steel-tired wheel business for over 20 years. After a service of more than 10 years with the Allen Paper Car Wheel Co., he designed and equipped the works of the National Car Wheel Co., at Chicago, Ill., and Depew, N. Y., and was Manager and afterwards President of that Company up to the time of its absorption by The Steel Tired Wheel Co., about four years ago, and has since been Secretary of the last named company.

The Osborn Engineering Co., Cleveland, Ohio, have been appointed engineers for the construction of the Kansas City & St. Joseph Electric Railroad. This road will be fifty miles long, and will be built for high speed service. The Osborn Engineering Co. will make the plans and specifications for track construction, overhead work, power house, mechanical and electrical installa-

tion, bridges, rolling stock, etc., and will also superintend the construction of this road in the field. Mr. Perry A. Gibson, of Kansas City, Mo., is the President of the railroad company.

Messrs. Pawling & Harnischfeger, Milwaukee, Wis., report many inquiries for traveling cranes. Among their recent orders are: American Sheet Steel Co., one 30-ton crane, with 5-ton auxiliary hoist, and one 10-ton crane; Anheuser-Busch Brewing Association, St. Louis, one 20-ton and one 5-ton crane; American Clay Working Machinery Co., two 20-ton and one 15-ton crane; American Bridge Co., Philadelphia, one 8-ton for the Post & McCord Branch, Brooklyn, and one 25-ton and one 8-ton for the Trenton Branch; A. & P. Roberts Co., Pen-coyd, one 25-ton with 5-ton auxiliary hoist; Curtis Sheet Steel & Corrugating Co., Zanesville, one 20-ton; Frankford Steel & Forging Co., one 10-ton; Oesterreichisch-Alpine Montangesellschaft, Vienna, Austria, one 5-ton; La Belle Iron Works, Steubenville, three 5-ton 100-ft. span and two 5-ton 80-ft. span; New York Shipbuilding Co., one 15-ton double trolley; Nordberg Mfg. Co., Milwaukee, two 30-ton and two 10-ton; Philadelphia & Reading, Pottsville, one 25-ton with 5-ton auxiliary hoist, and one 30-ton double trolley; Puget Sound Naval Station, Bremerton, Wash., one 10-ton; Wheeling Steel & Iron Co., Wheeling, two 10-ton; Sharon Steel Co., Sharon, one 5-ton; Parkersburg Steel & Iron Co., Parkersburg, W. Va., one 25-ton with 5-ton auxiliary hoist; North Mount Lyell Copper Co., Crotty, Kelly's Basin, New Zealand, one 40-ton with 5-ton auxiliary hoist; Laughlin Nail Co., Wheeling, one 20-ton; Chandler & Taylor Co., Indianapolis, one 10-ton.

Iron and Steel.

The Pencoyd Plant of the American Bridge Company shipped during March 7,339 tons.

The North & South Railway, mentioned under Railroad Construction, will soon be in the market for some 60-lb. rails.

The reorganized Pennsylvania Steel Co., was incorporated in New Jersey April 29 with a capital of \$50,000,000.

William Jones, heretofore Assistant Master Mechanic of the Edgar Thomas Steel Works, at Braddock, Pa., has resigned to go to Sidney, Cape Breton, where he will become Master Mechanic of the plant of the Dominion Iron & Steel Co.

The large rod, wire and nail mill plant of the Union Steel Co., at Donora, on the Monongahela River, in the Pittsburgh District, is expected to be put in operation the latter part of May. The plant is to have a daily capacity of 800 tons of rods.

The John Wales Wire Co. is incorporated in Maine, with a capital stock of \$200,000 to make and deal in iron and steel and other metals. The office is to be in Portland. The incorporators are: Geo. R. Wales, W. A. Eldredge, of Brookline, Mass.; C. M. Drummond and G. H. Horne, of Portland.

The Schonthal Iron & Steel Co. has been incorporated in Maryland to operate the Cumberland Rolling Mills for Edward H. Welch, Receiver of the Potomac Steel Co. The incorporators of the new company are Joseph Schonthal, of Columbus, Ohio; Howard C. Park, Columbus; David P. Miller, Arthur H. Amick, and De Warren H. Reynolds, of Cumberland. The capital stock is \$200,000.

To Make Cement.

The Kinderhook Portland Cement Co. has been incorporated under the laws of West Virginia, with a capital stock of \$500,000, to build a plant at Indianapolis, Ind., to make cement.

Changes in Carnegie Company.

The following changes have been made in the official personnel of the Carnegie Steel Company:

W. C. McCausland, elected Treasurer of the Carnegie Steel Company, April 16, 1901, was also elected a member of the Board of Directors. The board is now constituted as follows: William Ellis Corey, H. P. Bope, W. W. Blackburn, W. C. McCausland, J. H. Reed, Thomas Morrison, Charles M. Schwab, Daniel Clemson, W. H. Singer, J. E. Schwab, and E. H. Gary. In the sales department John E. Woods has been appointed Assistant General Manager of Sales, succeeding H. P. Bope, recently elected First Vice-President and General Manager of Sales. Jas. R. Mills, Jr., formerly sales representative in Cleveland, Ohio, has been appointed sales representative in Cleveland, succeeding Edwin S. Mills, who has been appointed assistant general manager of lake transportation for the United States Steel Corporation.

The Hudson River Tunnel.

The owners of the Hudson River tunnel have determined to complete that enterprise, according to a daily newspaper report. Asked about their plans and for information, one of the firm of Jacobs & Davis said: "We now have charge of the Hudson River property. The company has been reorganized and recapitalized, and there is every prospect of an early resumption of work after nine years of idleness. There is about 700 ft. on the New York side which remains to be bored. The old tunnel is now in as good condition as when the laborers left it in April, 1892. We have received no answer yet to the invitations for bids which we sent out to contractors, but we expect to get their replies very soon. The work is resumed at this time because money conditions are easier. The movement is in no way connected with the North River bridge matter or with A. L. Johnson's Philadelphia-New York trolley enterprise."

Pooling Locomotives Abolished on the Northwestern.

Pooling locomotives has been abolished on the entire system of the Chicago & Northwestern. This action is not taken because of the great number of locomotive failures, as recently stated in some newspaper reports, but is based on considerations of a general nature as related to the policy of the company. We have before us a statement of all engine failures on the system for February and March, 1901, and also for March, 1900, from which the accompanying figures are taken. The total of engine failures in March, 1901, was 490; the total engine miles 3,489,020; and the miles run per engine failure were 7,120. In March, 1900, there were 566 engine failures, and the miles run per engine failure were 6,372. In February, 1901, there were 543 engine failures and 5,712 miles were run per engine failure. When it is considered under what conditions failures are recorded against the 1,060 locomotives of the Northwestern this record shows that failures have not been numerous. Anything that delays an engine three minutes or over at any point on the line, at a station, or at a terminal, is registered as an engine failure. If, for example, a pin runs warm and the conductor is ready to leave a station in one minute, but the engineer uses two minutes more on the pin, an engine failure is recorded against the engine.

Heavy Double-Ended Locomotive for the New York Central.

The increase of weight on locomotive driving wheels on the New York Central, to which we referred specifically, March 8, in speaking of the general improvements of the roadbed, will soon be applied to suburban engines. A double-ended simple suburban engine, heavier than any engine previously used in this service, has just been ordered from the Schenectady Locomotive Works and will be delivered in July. The engine will have a single pair of leading truck wheels; a six-wheeled swivel truck under the tank; cylinders 20 x 24 in., and three pairs of driving wheels 63 in. in diam. The diameter of the boiler outside of the first ring will be 70 in., the grate surface about 63 sq. ft., the working steam pressure 200 lbs. to the sq. in. and the total heating surface about 2,400 sq. ft.; the fuel will be anthracite coal. The tender will carry 3,500 gals. of water and four tons of coal. The driving wheel base will be 15 ft.; the total wheel base 35 ft. 9 in.; the weight on driving wheels approximately 120,000 lbs., and the total weight of engine in working order 205,000 lbs. It may be noted that the weight on driving wheels, and the proportions generally, indicate a purpose to provide engines that will readily haul any suburban train in the service with due allowance made for bad weather and possibly bad fuel. With this weight it will be possible to meet the demand for rapid acceleration, with less slipping of driving wheels and wear of tires than usual in suburban traffic. This first engine will be in a measure experimental, and when it has been properly adapted to curves of short radius and other local conditions it is expected that a number of the engines will be built.

THE SCRAP HEAP.

Notes.

Portland papers say that the Maine Central has made extensive reductions in the number of men employed in the passenger train service. All trains, except the longest, are to be run with a smaller number of brakemen; and train porters are to be no longer employed.

Press despatches say that the Washington (D. C.) Traction Company has lately discovered that its treasury was being defrauded of large sums every day by the use of tickets which had been taken up and supposedly destroyed. According to the accounts, the tickets taken up each day were sent to the company's power house, to be burned up in the furnace, but the man in charge of the furnace succeeded in taking some of the tickets out before they were damaged by the fire, and sold them to conductors at a dollar a hundred.

Press despatches say that the Canadian Government has offered to lend a million dollars to the Montreal city government, at 3 per cent. interest, to be used in building grain elevators. The prosperity of the export grain trade through Montreal has been the subject of much discussion and anxiety of late; the grain dealers demanded better facilities, yet neither the city nor private capitalists could be induced to put up the desired elevators. The difficulty seems now to be ended.

The city of Detroit has passed an ordinance allowing street railroad companies to carry freight within the city limits, and in addition to the regulations which are usual in such cases the act requires all conductors and motormen to be not only citizens of the United States, but also "members in good standing of Division No. 26 of Detroit, or some other division of the Amalgamated Association of Street Railway Employees of America." To the "Labor leader" Detroit and Heaven must now appear to be one and the same place, we judge.

Bills have passed both houses of the Michigan Legislature providing for the taxation of railroads upon the basis of the value of their property, to be determined by a state board, instead of upon the basis of their earnings, as at present. A question has arisen as to who should do the work of making the assessment, whether the present Board of Tax Commissioners, or a special board appointed for that purpose, and upon this difference the matter has gone to a conference committee; but there seems little doubt that a law will be passed at the present session changing the system.

Pan-American Exposition Tickets.

The roads in the Central Passenger Association, which will have a joint agent in Buffalo during the time of the Pan-American Exposition, to validate the return portions of excursion tickets, are using special forms of tickets for the 15-day excursions, which are to be left in the hands of the joint agent until two hours before the time of departure on the return journey; this for the purpose of freezing out the scalpers as effectually as possible. The contract portion of these excursion tickets has the official number of the road terminating in Buffalo, printed, with red ink, in figures $\frac{3}{4}$ of an inch high (for example, a ticket reading to Buffalo over the Lake Shore & Michigan Southern has, in red, "466" immediately under the General Passenger Agent's signature). This greatly aids the joint agent and the station gatemen. Three colors of standard safety paper, with the General Ticket Agent's watermark, have been adopted for the three principal kinds of excursions, the five-day limit, at half fare plus \$1, the 15-day limit at two-thirds fare, and the short time, or "coach" excursion. Thus far "coach" excursions, the going tickets for which are good only on a specified train, have been advertised for only two days in May, the 15th and the 29th. In all these tickets the going date is punched on one side of the contract and the return date on the other. The five-day tickets have to be validated within the two-hour limit, but do not have to be deposited; the "coach excursion" tickets (one cent a mile) do not have to be validated.

Another Good Railroad Man Gone Wrong.

A few weeks ago we had occasion to notice the case of an unruly locomotive out in Iowa, which, having rather poor eyes, left its own proper line, although it was drawing an important through passenger train, and traveled about seven miles on a branch railroad, where it had no right to be. On March 15 a similar case occurred at Laingsburg, Mich. As reported in the *Detroit Journal*, a south-bound passenger train of the Michigan Central, traveling near Laingsburg about 10 p. m., came within less than 100 ft. of colliding with an engine running in the opposite direction; and this engine was one which belongs to the Pere Marquette road, and should have been running on the track of that company, which lies parallel to the Michigan Central for a short distance northward from Lansing. It appears that the Pere Marquette engineer, who was running without a train, was on his way from Detroit to Ionia. From Lansing to North Lansing he ran parallel to the line of the Michigan Central, and it appears that at North Lansing, where the lines diverge, the Michigan Central to the northeast and the Pere Marquette to the northwest, he was turned the wrong way by the mistake of a switch tender. At the time of the collision he had run about 15 miles in the wrong direction. Each engineer saw the headlight of the other train in season to apply brakes.

Fans at the Fore River Ship Yard.

The ship building plant of the Fore River Engine Co. at Quincy Point, Mass., contains several important applications of the fan blower. Draft for its boilers is produced by an induced draft fan drawing the gases directly from the up-take flue and discharging them through a small stack extending only a few feet above the roof. Under the forced system fan draft is likewise employed in the heating furnaces and forges while the smoke is removed from the forges through hoods communicating with an exhaust fan. All buildings are heated by the hot blast system. Notwithstanding the exposed position of the buildings, this—the first winter—has been passed with uniform internal temperature throughout all of the buildings.

For a Wharf at Guayaquil.

Vice-Consul-General Reinberg, of Guayaquil, transmits a copy of a concession of the Ecuadorian Government for a wharf at Guayaquil, which is summarized as follows: The wharf is to be 1,500 ft. long; of iron, wooden floored, with steel joists and roofed with iron. The wharf must have appliances which will enable it to discharge 1,500 tons of freight in 12 hours. All materials and machinery for construction are exempt from entrance duty. The wharf must be completed within three years from date of contract. For each year of delay the contractors (Martin Reinberg & Co.) will forfeit to the Government \$100,000 per annum. The maximum capital of the company will be \$973,300.

Two-Foot Gage Railroads in Maine.

A correspondent of the *Boston Herald* calls attention to the fact that the 2-ft. gage railroads in the State of Maine now aggregate a length of 156 miles. There are seven companies: The Sandy River, Farmington to Phillips, 18 miles; Bridgton & Saco River, connecting Harrison with Hiram, 21 miles; Phillips & Rangeley, connecting the towns thus named, 29 miles; Franklin & Megantic, from Strong to Bigelow, 31 miles; Wiscasset & Quebec, connecting Wiscasset and Albion, 44 miles; Kennebec Central, connecting Randolph and Togus, five miles; Monson, from Monson to Monson Junction, eight miles. These roads own 22 locomotives, 23 passenger cars and 324 baggage, freight and miscellaneous cars. It is said that charters have been granted to several other companies which intend to build railroads of this gage. The officers of the Bridgton & Saco River say that they have inquiries from all over the United States, as well as from Europe and the West Indies, asking about their experience with the narrow gage; and lately a party of investigators from New Orleans, Central America and South America visited Maine to inspect the railroad. The standard locomotive on the Bridgton & Saco River weighs 13 tons.

Car Coupling Races.

For many years past Good Friday has been a favorite day for holding a "Shunters' Derby," i. e., contests of speed in coupling and uncoupling trucks. Particulars are to hand of "the fourteenth annual coupling contests" for employees of the Furness Railway, held at Barrow last Friday, when the champion, R. Wilkinson, coupled and uncoupled 15 wagons in 1 min. 3.45 sec., and 20 trucks in 1 min. 28.15 sec. In the 20-truck contest the competition was excitingly close, the second man being only one-fifth of a second behind the winner. Of course, the shunting pole is used in these contests, and undoubtedly in skilful hands it is a very efficient instrument. Unfortunately, the pole has its own peculiar dangers, as was horribly evidenced a little while ago at West Hartlepool, when an engine driver, whilst stooping down to oil his engine, was impaled on the pole of a passing shunter, a moving truck catching one end of the pole and sending the other end into the engine driver's body with fatal results.—*Transport.*

The London Underground.

The *Daily Express* declares that Mr. Yerkes has obtained a controlling interest in the old underground rail-

ways of London. So far as the Metropolitan Company is concerned, I believe there is no truth in this assertion, but it is quite likely that Mr. Yerkes or some other American financiers have been investing largely in the stock of the District, with a view to placing the electrification of that line in American hands. It is well known that the British Westinghouse Company, which is largely an American concern, notwithstanding its title, is straining every nerve to obtain the contract for electrifying the "Inner Circle," and that this company is willing to finance as well as carry out the contract. It is very possible that Mr. Yerkes and the British Westinghouse people have joined forces. With regard to his going into other "tube" schemes in addition to the Charing Cross, Euston and Hampstead, I believe that Mr. Yerkes has decided to do nothing further in this direction until the Vibration Committee now sitting presents its report.—*Transport.*

British Runners and High Boiler Pressure.

My readers may remember the reference I made a few weeks ago to the ingenious argument of Mr. Bell, M. P., that the drivers and firemen of very large engines ought to be compensated for the extra work required, as locomotives were now being built one of which could do the work of three smaller ones. I refer to this again to point out what is really the cause of the opposition of the Amalgamated Society of Railway Servants to "high-pressure engines," as I observe that Mr. Bell and certain other spokesmen of the society are taking advantage of the recent unfortunate accident on the Lancashire & Yorkshire Railway to oppose the use of more powerful engines on an absolutely different ground to that referred to above. Of course until the cause of the accident on the Lancashire & Yorkshire Railway is authoritatively ascertained these engines will be open to a certain amount of suspicion on the score of danger to the men in charge of them. All that I am now concerned to point out is that Mr. Bell and his friends began their crusade against large locomotives before the Lancashire & Yorkshire accident, and that at that time they made no reference whatever to possible danger to the drivers and firemen. A correspondent suggests that the engine drivers and firemen who assert that "high-pressure engines" are not safe should be examined as to their knowledge of locomotives.—*Transport.*

Research in Iron Metallurgy.

Mr. Andrew Carnegie has founded a research scholarship in connection with the British Iron and Steel Institute. He has given to the institute \$32,000 of Pittsburgh, Bessemer & Lake Erie 5 per cent. debenture bonds, the income from which is to be applied in awarding annually one or more scholarships of such value as the Council of the Institute shall decide. The awards will be made irrespective of sex or nationality. The scholarships will be tenable for a year, and will be renewable at the discretion of the Council. The object is to enable trained students to conduct research in the metallurgy of iron and steel and allied subjects.

The Suspension of Electric Cabs in Paris.

We hope that the disappearance of electric cabs from the streets of Paris is only temporary; but in the meantime the hundred vehicles put in service by the Compagnie Générale des Petites Voitures have been withdrawn. The Paris Cab Company had installed a very complete charging station for the accumulators; the unsatisfactory results with these have caused the withdrawal of the vehicles. In spite of the considerable weight of the battery, a travel of only 50 kilometers, including an average of five kilometers for going to and from the charging station, was possible. The useful 45 kilometers were insufficient to pay the expenses incurred. The Cab Company is now looking for a type of accumulator that will pay its way and leave something for profit. A mistake was undoubtedly made in locating the charging station in a remote district.—*Traction and Transmission.*

The Cascade Tunnel.

A despatch from Tacoma of the 8th says that "there is to be a change in working the Cascade Tunnel on the Great Northern. The accident of over a week ago, whereby one engineer lost his life and two other members of the train crew are still confined to the hospital from the effect of gas and smoke, has hastened the plans. There will be no more heavy trains hauled through the tunnel on the up-grade, the eastern end of the tunnel being 235 ft. higher than the western end. A lower tonnage has been fixed as a maximum for trains passing through the tunnel and trains hereafter will make one-fifth better time in the tunnel than is made on other parts of the line."

The New Government Printing Office.

The steel work of the new Government Printing Office at Washington has been completed to the seventh, and top, story. The steel frame of the lift and roof will be finished in about six weeks, and the building will be completed June 1, 1902. The building is oblong, fronting 408 ft. on G street and 175 1/4 ft. on North Capitol street, and has an interior court 29 x 168 ft. It has 370 steel columns, and is a fine example of steel building. About 10,000,000 bricks and 6,000 tons of steel will be used. The building will have 12 electric elevators, 7,000 incandescent electric lights, electric fans and electric power, steam heat, special ventilating arrangements, filtered drinking water from tanks connected with an ice plant, and a crematory to destroy refuse. The building was authorized March 3, 1899, and Lieut. J. S. Sewell, Engineer Corps, U. S. A., was placed in charge of the work. The estimated cost was \$2,429,000, of which \$500,000 has already been expended.

Cleaning Cars by Compressed Air.

At a recent meeting of the St. Louis Railway Club Mr. Gohen, of the Big Four, spoke of a good arrangement used by that road to protect car cleaners from danger of infection by dust. "We are cleaning cars with air, and we are granting immunity to our men who clean them, from infection by this dust. It is a very simple operation, and I cannot explain its details to this club just now, but we have at our Shelby street shops in Indianapolis, where we clean a great many cars by air, and also in Cincinnati, an attachment put upon the end of this air blowing machine, which carries all the dust that accumulates through the blowing out of the car, outside of the car into the air, through the means of a piece of hose—engine tank hose, I guess. It is about the size of engine tank hose. That is attached to our blower in such a way as to carry all the dust and everything out into the air, so that the classes who in reality should be guaranteed from immunity are those people on the outside."

Architectural Commission for Washington.

As a result of a conference held recently in Washington between the sub-committee of the Senate Committee

on the District of Columbia, and a number of members of the American Institute of Architects, on the subject of formulating a general plan for a park system for Washington and locations for future public buildings, the plans and report to be presented to Congress in December next, a commission consisting of Messrs. D. H. Burnham, of Chicago; Charles McKim, of New York, and Frederick Law Olmstead, of Boston, has been appointed to prepare the plans.

On City Boiler Inspection.

The *Engineer* says of the explosion of a boiler at the Doremus laundry in Chicago that from the reports received it appears that the inspection of all the steam boilers in the city of Chicago is carried on practically by two men. These men, it is claimed, made no less than 6,000 inspections during a single year. Allowing 300 working days a year, this means that each inspector entered no less than ten boilers during each working day, which is a remarkable record to say the least. We have known of inspectors occasionally reaching that figure for a single day, perhaps for two days, but that this rate could be continued for an entire year is incredible. The fact is worthy of note that it requires an inspector receiving \$7,000 per year to superintend the work of the two men upon whom the responsibility for the proper inspection of all Chicago's boilers rests.

Railroads for Abyssinia.

According to the annual report of the New Egyptian Company, Limited, of Cairo, this concern together with the new African company and the Oceana Consolidated Company, are going to build railroads in Abyssinia. The newly formed Imperial Ethiopian Railway Company has acquired the concession granted by King Menelik for a railroad from Adis Abbaba to the Somali coast. This line, the report says, has been completed from Jibuti through French Somaliland up to the frontier of Abyssinia, whence the prolongation to Harrar is under way of construction. It is intended to build a branch line to one of the ports of British Somaliland, whereby it is hoped to open the markets of the interior of Abyssinia to the world.

Notes from the Argentine Republic.

The Northeastern Argentine Railway extension to Santo Tome is open for traffic.

Work on the Bahia Blanca Mole, of the Great Southern, is progressing favorably. The steel piling of the extension is practically complete, and a portion of the extension is open for public use. This adds room for one more steamer at once to the berthing capacity of the Mole.

Passenger traffic on railroads from Buenos Ayres to the seaside and the mountain summer resorts is very heavy. One evening lately four night expresses went out carrying 38 sleeping cars. A special limited train went out with 21 sleeping cars and two restaurant cars, together with luggage vans. This was run in two sections. All of these cars are of the American type with bogie trucks. The Great Southern has 60 sleeping cars in service, 12 building, and will build more at once.

Large Ocean Steamers.

The steel steamer "Korea" was launched on March 23 from the yards of the Newport News Shipbuilding and Dry Docks Co., where she is being built for the Pacific Mail Steamship Co., and a sister ship, the "Siberia," will be launched late in April. Both ships are being built for service between San Francisco and Hong Kong, and will be capable of making 18 knots an hour. The main engines consist of two 4-cylinder quadruple expansion engines of the vertical inverted direct-acting type, placed abreast of each other in separate watertight compartments. They are designed to develop 18,000 i. h. p. at 86 revolutions a minute. The dimensions of both ships are: Length over all, 572 ft. 4 in., and between perpendiculars, 550 ft.; beam, 63 ft.; depth, 40 ft.; draft, 27 ft.; displacement, 18,600 tons. A double bottom extends from stem to stern. Accommodations will be provided for 200 cabin and 30 white steerage passengers, and 1,200 Chinese passengers, the space for the Chinese being so arranged that it can be used for freight when no Chinese are on board.

Technical Schools.

Rensselaer Polytechnic Institute.—Mr. Merrill Watson, Manager of the New York Expanded Metal Company, delivered a lecture on "Iron and Concrete in Construction," Friday, April 26, before the students of the Rensselaer Polytechnic Institute at Troy, N. Y.

Worcester Polytechnic Institute.—Edmund Arthur Engler, A. M., Ph. D., professor of mathematics and dean of the engineering school, Washington University, St. Louis, Mo., has accepted the Presidency of the Worcester Polytechnic Institute, to succeed Dr. T. C. Mendenhall, who, as recently noted, has resigned on account of continued poor health. Dr. Engler was born in St. Louis in 1856. He was graduated from Washington University at 20 years of age, and since 1881 has been on the faculty of the university, the last five years serving also as dean of the engineering school. Dr. Engler is an able investigator and clear writer in his special field of study—higher mathematics—and is also known as an excellent classical scholar. Among other offices in scientific societies, he is secretary of the Academy of Sciences, of St. Louis, one of the strongest scientific organizations of the West. He has been a close observer of educational methods in technical schools in Europe, as well as at home, and has pursued special courses of study at the University of Berlin and at Paris.

Regulating the "Club Car."

Superintendent Van Etten, of the New York Central, has issued an order designed to break up what is said to be a system of favoritism extended by train baggage-men to commuters. The order is as follows: "Beginning on May 1, 1901, the baggage cars running on the Hudson and Harlem divisions (to and from New York) in which some of our patrons have been permitted to place chairs, will contain chairs furnished by this company; other chairs than those furnished by the company not being permitted in the cars. To such of our patrons as desire to occupy these chairs a charge of \$7.50 for six months, or \$10 per annum, will be made, and tickets issued for such chair as the holder may select if unoccupied. These tickets may be obtained of the station agent at Grand Central Station, and seat selected from a chart which will be on exhibition. Chairs belonging to individuals in cars referred to must be removed if wanted before May 1."

Electric Railroads in Montreal.

Consul-General Bittering, at Montreal, under date of April 11, writes the State Department that there are

102½ miles of electric road in that city; as motor power, there are available six engines of 600 h.p. each, one engine of 3,000 h.p., 12 200-kw. generators, six 300-kw. generators, and one 1,500-kw. generator. The rolling stock consists of 372 closed and 370 open cars. The company's capital at present is \$5,500,000 paid up. In 1900, the company carried 43,362,262 passengers. Last year's business showed a net profit of \$647,246.64, as compared with \$630,870.61 for the year 1899. The above does not include the suburban railroads.

Damascus to Mecca.

The pilgrims' railroad from Damascus to Mecca has made very little progress, for lack of money; piety, capital and liberality not being always united among Mussulmans any more than among Christians. But we may now expect the dirt to fly; for the Sultan and his Ministers are said to have held a special cabinet meeting at which the following plan was adopted, which is to throw the burden on the sheep. At the feast of Beiram, all the faithful who can possibly afford it have a roast lamb or sheep, much as we have a turkey Thanksgiving. There is, therefore, great mortality among the flocks at this season. Now the plan is to have all the pelts of these sacrificed animals brought to local officials, who will sell them at auction to pious Moslems, who are expected to bid high for them. The proceeds are to go towards building the railroad. In this country it is usually after the railroad is built that the lambs lose their pelts.

Where Some Corn Goes.

Peoria, Ill., seems to have an abnormal appetite for corn. The last census credits it with 56,000 inhabitants, yet in 1900 it received 11,223,000 bushels of corn more than it shipped, which is an allowance of 200 bushels for each man, woman and babe. Certainly they cannot worry all that down, at least not in that shape. An indication of the fate of this corn may be found in the fact that in the same year Peoria shipped 369,314 barrels of whisky, while it received only 26,805. Peoria receives corn and exports the fluid extract thereof. It also manufactures and ships starch enough to consume some 3,000,000 bushels of grain.

Coal, Iron and Steel Production of France.

The production of coal in France for the year 1900 was 33,270,385 tons, as compared with a production of 32,862,712 in 1899, an increase of 407,673 tons. Of the amount of coal imported into France, 8,600,000 tons were brought from Great Britain. The production of iron in France during 1900 was 2,699,494 tons, an increase of 121,093 over the previous year. The production of iron rails, sheet iron, etc., in 1900, amounted to 745,312 tons, a net decrease of 88,556 tons. During the year 1900 there was made in France 295,915 tons of steel rails, which was an increase of 40,249 tons. Compared with the production of 1899, the production of sheet steel also showed an increase, being 301,651 tons as compared with 278,690 tons in 1899. There were 38,133 tons less of commercial steel made in 1900 than in 1899.

Electric Power for Oakland, Cal., from Yuba River.

Electric power was transmitted 140 miles from Yuba River to Oakland, Cal., last Sunday, when street cars were operated with it by this means for the first time at that point. The power is generated by turbines at the river and is carried on a copper and aluminum alloy cable .6 in. in diam. The cable, in the course of the line, is suspended in a clear span above Carquinez Straits, 4,400 ft. long and 300 ft. above the water. It is said that 40,000 volts of alternating current were transmitted with a loss not exceeding 5 per cent., the voltage being reduced to the service requirements at the power station. It was intended later to send current over the company's lines to San Jose, 190 miles from the generating plant, but we are not as yet informed as to the result of this experiment.

Wages on the Central of New Jersey.

The conference of the last three weeks between the Central Railroad of New Jersey and committees of employees have ended in an agreement which both sides pronounce satisfactory. The grievances of the trainmen and yardmen were adjusted two weeks ago, and those of the engineers and firemen soon after; but those of the telegraphers were delayed. The final agreement was signed April 24 by these chairmen of the organized divisions of the employees: For the engineers, John V. Waite; for the firemen, Timothy Shea; for the conductors, L. P. Titus; for the trainmen, J. W. Harrison; and for the telegraphers, John Nelligan. General Superintendent J. H. Olhausen signed for the railroad. It is said that all the employees have obtained advances in their wages excepting the telegraphers. Advances have been made to a few of the telegraphers, who have responsible positions, but there has been no general advance. Concessions were made, however, which will give them better pay for overtime, etc. It is reported that the agreement is in part as follows: Baggage masters, for a 12-hour day: Philadelphia runs, \$2.20 per day; all other runs, \$2.10; brakemen, Philadelphia runs, \$2; other runs, \$1.80. Freight service: Flagmen, \$1.85 for 100 miles; brakemen, \$1.83 for 100 miles. Jersey City and Mauch Chunk schedule: Flagmen, \$1.95 per day; brakemen, \$1.90. Local freight: Flagmen, \$1.95 per day; brakemen, \$1.90 per day. Drillers (switchmen), Jersey City terminal: Head drillers, \$2.64 a day for day work and \$2.76 for night work; other terminals, \$2.16 for day work and \$2.28 for night work. Drillers at other places: Head drillers, \$2.50; ordinary drillers, \$2. The freight-train day is to be 10 hours. It was said by the men that these wages average an advance of 10 per cent. Minimum telegraphers' wages at present are \$40 per month. It was agreed that this should stand, but a demand will be made for an advance for the more important work.

Electric Work for Australia.

Mr. Frederick H. Chamberlain, of the General Electric Co., will sail from San Francisco early in May to superintend the installation of a plant at Sydney, New South Wales, for the Australian Tram Co., for which the General Electric Co. has the contract.

The Torpedo Boat "Bailey."

The torpedo boat "Bailey" on her final trial at New London, Conn., on April 24, with a board of five naval officers on board, headed by Rear Admiral R. D. Evans, U. S. N., made an average speed of 30.2 knots for two hours, her best speed being 31 knots. The "Bailey" is of 235 tons displacement, with steel hull, twin screws and 5,600 i. h. p. She was built by the Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, at Morris Heights, N. Y.

The U. P. Farewell to McConnell.

Recently about 70 employees of the mechanical department of the Union Pacific assembled in Omaha at

a dinner to bid good-bye to Mr. McConnell, who has lately been succeeded as Superintendent of Machinery and Motive Power by Mr. S. Higgins. Mr. A. A. Gibson, Foreman of Shops at Omaha, was the Chairman of the evening and toastmaster. When Mr. McConnell's health was drunk he was presented with a testimonial in the form of an order for a watch, to be selected by himself and to cost not less than \$1,000. Mr. McConnell made a short but appreciative speech, and ended by proposing success of the new Superintendent of Motive Power of the Union Pacific Railroad.

The Friction Brake Again.

It is many a day since our old acquaintance, the friction brake, has appeared above the horizon; but an enterprising United States Consul has found it again, this time in Belgium. Read these familiar words: "Experiments are being made with a new brake for railroad trains, which would reduce the running time more than one-third at a speed of 80 kilometers (49.7 miles) per hour. It is known as the Luyers' system, and consists principally in a friction pulley fastened to the axle, on which the shoes act, permitting a quick stop with remarkable smoothness. Satisfactory trials were made last year with a car on the Ghent-Terneuzen Railroad Company's lines, and the Minister of Railroad authorized the placing of friction pulleys on ten 15-ton cars provided with Westinghouse brakes, to serve as the final test. This took place at Setzaete, in the presence of engineers representing the principal railroad companies of France, Germany, the Netherlands and Spain. The result was favorable at all rates of speed. With the tire-brake now in use, a train at a speed of 81 kilometers (50.3 miles) per hour may be stopped within 290 meters (990 feet) in 25 seconds, while the Luyers brake can stop a train at the same speed in a distance of only 171 meters (438 ft.) under the same conditions of adhesion and pressure, and in less than 16 seconds."

Engineering Enterprises in Korea.

The American firm of Collbran & Bostwick has received the contracts for a highway 18 miles long, to cost \$141,930, and for the extension along this road of the present electric street railway, to cost \$358,560, in connection with an electric-lighting plant for the city of Seoul. The same firm has a contract for the erection of a bank and office building in Seoul to cost \$34,860, and for purchasing nickel blanks sufficient for the coinage of nickel 5-cent pieces, to the value of \$2,000,000. It has also secured the contract for the system of water-works for the city, which will cost in the neighborhood of \$1,494,000, to be paid for by a loan secured upon the Korean customs revenues.

The Seoul-Fusan Railroad, which the Japanese are endeavoring to build, would be excellent for the development of Korea, but it is a question whether it would add enough to the facility of travel to repay the large expense entailed in its construction and operation. Steamers can easily make the voyage from Fusan to Chemulpo in 48 hours, while it is announced that the journey by rail will occupy 36. However, a committee of 40 has been formed to promote the building of this railroad.

The President's Train.

The train on which President McKinley and his party left Washington on Monday morning for a six weeks' trip through the West, is probably the most completely equipped for comfort and enjoyment of any train so far used in this country. It consists of eight Pullman cars, the outside painted olive green touched with gold. There are a baggage car, a combination baggage and smoking car, the latter with barber shop and bath room, with writing desk and books in the smoking compartment. Then come two 12-section sleepers, one of which is occupied by the newspaper men; then the dining car "St. James," and next two compartment cars with seven state rooms and a drawing room in each. The rear car of the train is occupied by the President and Mrs. McKinley. It is 70 ft. long, and has five private rooms, a sitting room and a dining and observation room. There are 24 guests in the President's party, including four members of the Cabinet with ladies of their families; Mr. J. Kruttschnitt, Fourth Vice-President of the Southern Pacific, and Mr. L. Brown, General Agent of the Southern Railway.

LOCOMOTIVE BUILDING.

The Missouri, Kansas & Texas is in the market for five mogul locomotives.

The Cuba Co. is having six engines built by the International Power Co.

The Great Northern, it is reported, will soon order a large number of locomotives.

The Chicago Great Western is reported to be in the market for a few locomotives.

General J. S. Casement is having one engine built by the Dickson Locomotive Works.

The Bangor & Aroostook has ordered 10 engines from the Manchester Locomotive Works.

The North & South Railway, at Nevada, Iowa, will soon be in the market for some locomotives.

The Sandy Hook Proving Grounds are having one locomotive built by the Pittsburgh Locomotive Works.

The Central of Georgia has ordered five consolidation engines, as noted in our issue of April 29, for September delivery, from the Cooke Locomotive Works. They will weigh 196,000 lbs. with 174,000 lbs. on the driving wheels, and have 21-in. x 32-in. cylinders, 55-in. driving wheels, straight-top boilers with a working steam pressure of 200 lbs., 375 tubes, 2 in. in diam. and 14 ft. long; fire-boxes 123 in. long and 39½ in. wide, and a tender capacity for 4,500 gals. of water and 10 tons of coal. The specifications include New York brakes, Sterlingworth brake-beams, Gallagher couplers, Monitor No. 10 injectors, Prendergast's packings, Crosby's safety valves, Leach sanding devices, Nathan lubricators, French Spring Company's springs and Krupp tires on driving wheels.

CAR BUILDING.

The Pullman Co. is building six coaches for general service.

The Southern Pacific has asked prices on 40 passenger coaches.

The Pennsylvania is in the market for 33 cars for passenger service.

The Georgia R. R. will build at its own shops from 250 to 300 box cars.

The Louisville & Nashville is having three coaches built by the Pullman Co.

The Michigan Alkali Co. is having 70 freight cars built by the Pressed Steel Car Co.

The New York, Ontario & Western is having eight coaches built by Harlan & Hollingsworth.

The Baltimore & Ohio is reported to be in the market for 1,000 freight cars of various kinds.

The Chicago & Eastern Illinois has ordered 16 cabooses from the Mt. Vernon Car Manufacturing Co.

The North & South Railway Company, at Nevada, Iowa, will soon be in the market for rolling stock.

The Great Northern has ordered six combination and two mail cars from the American Car & Foundry Co.

The Columbus & Buckeye Lake Traction Co. is reported to have ordered five cars, 6 ft. long, from Jewett Car Co.

The Texas Central has placed an order with the American Car & Foundry Co. for 20 flat cars of 60,000 lbs. capacity.

The St. Louis & San Francisco has placed an additional order with the American Car & Foundry Co. for five chair cars.

The Duluth, South Shore & Atlantic has ordered 175 cars of 80,000 lbs. capacity from the American Car & Foundry Co.

The Southern Pacific has ordered 1,500 cars from the Barney & Smith Car Co., 250 from the American Car & Foundry Co., and 1,000 from the Pullman Co.

The Great Northern has ordered 50 coaches and four dining cars from the Barney & Smith Car Co., and 24 cars for passenger service from the American Car & Foundry Co.

The Marquette & Southeastern order with the Pressed Steel Car Co. calls for 25 box cars of 70,000 lbs. capacity. They will be 36 ft. long with steel underframes, trucks and bolsters.

The Detroit & Mackinac has ordered from the Barney & Smith Car Co. 75 flat cars, 25 stock cars and 50 box cars, all of 60,000 lbs. capacity, for April delivery, and four coaches and three combination cars.

The Norfolk & Western will build 500 coal cars of 100,000 lbs. capacity at its Roanoke shops for April 15 to July 1 delivery. They will weigh 38,000 lbs. and measure 34 ft. long. The special equipments include Westinghouse brakes, Ajax brasses, Chicago couplers, Pressed steel journal boxes and Scott springs.

The Chicago, Milwaukee & St. Paul, as reported last week, will build at its shops 1,000 box cars of 60,000 lbs. capacity. They will weigh 30,000 lbs., measure 33 ft. long, 8 ft. 6 in. wide inside, 8 ft. high. They will be equipped with Congdon brake-shoes, Westinghouse brakes, pressed steel journal box lids, Murphy and Chicago roofs.

The Cudahy Refrigerator Line has ordered 217 refrigerator cars of 60,000 lbs. capacity for July delivery from the American Car & Foundry Co. They will measure 36 ft. 8 in. long over end sills, 8 ft. 10 in. wide over sills, and the specifications will include American steel bolsters, Sargent brake-shoes, Westinghouse brakes, Chicago couplers, National Malleable journal boxes and box lids, Torsion roofs, Detroit springs and American steel trucks.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 300 box cars of 60,000 lbs. capacity from the American Car & Foundry Co. They will weigh 30,700 lbs., measure 35 ft. long, 8 ft. 11 in. wide and 8 ft. ¼ in. high inside. The special equipments include Common Sense bolsters, Sterlingworth brake-beams, Congdon brake-shoes, Westinghouse brakes, Fulton brasses, Dunham doors, Butler draft rigging, McCord journal box and box lids, Chicago roof and Diamond trucks.

The Central of Georgia will build at its own shops 300 wooden box cars of 80,000 lbs. capacity, as noted in our issue of April 29, for immediate delivery. The cars will weigh 35,000 lbs., and will be 36 ft. long inside, 8 ft. 6 in. wide inside, and 7 ft. 7 in. high inside. The specifications include Diamond brake-beams, Lappin's "Congdon" brake-shoes, New York brakes, Ajax Metal Company's brasses, Dayton Malleable Iron Company's couplers, Jones car doors, Butler draft-gear, McCord journal boxes and box lids, Lowe Brothers' paint, Scott springs and Decatur car wheels.

The Southern Missouri & Arkansas is having the following equipment built by the American Car & Foundry Co.: One first class coach, one combination coach and smoker, one combination mail and baggage car, 15 coal cars of 60,000 lbs. capacity, Missouri Pacific standard, 15 flat cars of 60,000 lbs. capacity and 10 side dump cars of 60,000 lbs. capacity. The passenger coach and the combination coach and smoker will each be 61 ft. long, 9 ft. 10 in. wide and 14 ft. high. The combination mail and baggage car will be 60 ft. 9 in. long, 9 ft. 10 in. wide and 14 ft. high. These passenger cars will be equipped with Christie brake-shoes, Westinghouse brakes, American Car & Foundry Co.'s draft rigging, Baker heaters, pressed steel journal box lids, Standard steel platforms, American Car & Foundry Co.'s roofs, American Car & Foundry Co.'s trucks, Pullman wide vestibules and Standard steel wheels. The coal cars will have Shickle, Harrison & Howard transoms and Player trucks.

BRIDGE BUILDING.

BANGOR, ME.—Sealed proposals will be received for the erection of an iron bridge of two spans until May 13, 2 p. m. Plans of the foundations, with full instructions to bidders, can be obtained of P. H. Coombs, City Engineer, Room 12, City Hall.

BEAVERTON, ONT.—Richard R. Rogers, Superintending Engineer of the Trent Canal, Peterboro, Ont., informs us that plans are being made for a drawbridge over the Trent Canal near Lake Simcoe.

BOSTON, MASS.—Bids are wanted, May 13, for building the Mattapan bridge and approaches in Blue Hills Parkway. Wm. T. Pierce, Engineer, Metropolitan Park Commission.

BRIDGEPORT, CONN.—The Scherzer Rolling Lift Bridge Company, Chicago, has a contract from the New York, New Haven & Hartford to design, prepare plans and supervise the construction of a four-track Scherzer rolling lift bridge across the Pequonnock River at Bridgeport, Conn. The new bridge is to replace the existing double-track swing bridge, which will be discarded and removed in the process of four-tracking the main lines of the

New York, New Haven & Hartford at this point. The new bridge will be a deck structure. It will be composed of two parallel, double-track, movable spans, which may be operated jointly or singly, as desired. The motive power will be electricity, and the bridge will be opened or closed in less than 30 seconds, thus causing the least possible delay to railroad traffic from the opening of the bridge for the passage of vessels. The bridge will be designed to carry the heaviest loadings, in accordance with the specifications of the New York, New Haven & Hartford Railroad for 1901. Tracks can be added to the structure by building single or double rolling lift bridges next to the main bridge.

BRISTOL, TENN.-VA.—The Street Committee has decided that plate girder bridges be built for the two bridges proposed on Main street, according to plans now on file.

BUFFALO, N. Y.—The bridges over the Clark and Skinner Canal at Erie street, and the bridge at Elk street, over the Ohio Basin slip, have been condemned by the State Engineering Department.

CARVER, MINN.—Bids are wanted for two stone arch bridges on May 6. O. C. Brunius, Village Recorder.

CATASAUQUA, PA.—The Crane Iron Works inform us that they want bids with plans for a 70-ft. through steel span over the canal at this point; also for three 89-ft. and one 88-ft. through steel span over Lehigh River. J. M. Fitzgerald, Secretary.

CHICAGO, ILL.—Local reports state that Mayor Harrison has sent an ordinance to the Councils for the elimination of grade crossings by elevating West Kinzie and North Canal streets on a viaduct beginning at Franklin street on the east, and connecting with the Desplaines and Halstead street viaducts and descending to grade near Ada street. The viaduct on Kinzie street as proposed connects with the present Milwaukee avenue viaduct. In Canal street the elevated roadway is to extend from Kinzie street to West Fulton, where it begins to descend to the grade level at Lake street and Milwaukee avenue. The river is to be spanned by a double-decked bridge extending from the intersection of Milwaukee avenue and Desplaines street to Kingsbury street and thence to the level at Franklin street. The cost of the elevated roadway and of the bridge is to be borne by the Chicago & Northwestern, the Pittsburgh, Cincinnati, Chicago & St. Louis and the Chicago, Milwaukee & St. Paul. The cost is estimated at \$600,000, according to City Engineer Ericson, who made the plans.

CLEVELAND, OHIO.—Bids are wanted, May 11, for a 102-ft. steel bridge over Rocky River, Strongsville. Julian C. Dorn, Clerk, Board of County Commissioners.

COLUMBUS, OHIO.—County Surveyor Henry Maetzel is making plans for a bridge to be built over Black Lick by Franklin and Fairfield counties.

DECATUR, ALA.—The Southern Ry. has let a contract to the Phoenix Bridge Co. for the steel for its drawbridge over the Tennessee River.

The Louisville & Nashville will also build a bridge over the Tennessee River, but at the present time the plans are not made.

DES MOINES, IOWA.—George M. King, City Engineer, informs us that he has been directed to prepare plans and specifications for a bridge over the Des Moines River at East Sixth street.

DETROIT, MICH.—The Detroit & Toledo Short Line is about to let a contract for a 480-ft. steel bridge of three spans.

DOVER, DEL.—May 7 is the date for opening bids for a bridge over Silver Lake, north of Dover. Robert S. Downs, Clerk, Levy Court.

DUNKIRK, N. Y.—According to report, bids are wanted, May 7, for two bridges over Douglas Creek. James P. Morrissey, City Engineer.

FREMONT, OHIO.—The County Commissioners are considering building a new bridge over Sandusky River at this place.

GONZALES, TEXAS.—The county has voted to issue \$30,000 of bonds for bridges to be built as follows: One across Peach Creek at the Braches crossing, A. W. Harman, Commissioner, Gonzales; one across Foster Branch, near Belmont, J. C. West, Commissioner, Leesville; one across Copperas Creek, near Waelder, N. F. Miller, Commissioner, Waelder. Address the Commissioners as above.

HOLYOKE, MASS.—The City Engineer has made plans for a new bridge over the canal adjoining the Valley Paper Co. Estimated cost \$7,500.

INDIANAPOLIS, IND.—Bids are wanted, May 14, according to report, for three bridges. Harry B. Smith, County Auditor.

The county has been petitioned to extend College avenue by building a bridge over Fall Creek to Broad Ripple.

MIAMISBURG, OHIO.—The Southern Ohio Traction Co. will build a bridge over the Miami River at this point.

MOJESTO, CAL.—A bridge proposed by the Commissioners of Stanislaus County and Merced County over the San Joaquin River at Hills Ferry will consist of a draw span of 222 ft., and a fixed span of 80 ft. The cost will be about \$20,000. Bids are wanted, June 5.

MONTREAL, QUE.—The Montreal Bridge Co., organized in 1890, to build a bridge over the St. Lawrence River, is reported ready to build. The bridge will be about 8,420 ft. long and cost several millions of dollars.

NEW YORK, N. Y.—Three bids were received by the New East River Bridge Commissioners on April 25 for the steel suspended structure of the bridge now building. The Pennsylvania Steel Co., which has the contract for the approaches, was the lowest at \$1,123,400. The King Bridge Co. bid \$1,151,500 and the Eastern Tube Co. bid \$1,264,000. The provisions of the contract require the completion of the work within eight months after the work is ordered begun by the Bridge Engineer.

The Council has authorized a bond issue of \$664,495.63 for the Vernon avenue bridge over Newtown Creek. The present structure is a low wooden bridge operated by hand. It is proposed to build a high-level bridge, with a viaduct approach over the railroad tracks.

The City Council has authorized an issue of bonds for \$556,000 for building the piers of the Blackwell's Island bridge.

NORWALK, OHIO.—Plans have been made by W. J. Watson, of Cleveland, for a steel bridge 400 ft. long to cross Vermillion River at Norwalk, for the Cleveland, Elyria & Western (electric road). The cost is estimated at \$20,000.

OROVILLE, CAL.—The Butte County Supervisors want bids for a bridge over Oroville River to cost about \$8,000.

OZARK, ARK.—Bids are wanted for two steel bridges,

one 145 ft., the other 90 ft., on May 8. Address County Commissioners.

PASCAGOULA, MISS.—The Mobile, Jackson & Kansas City R. R. will build a bridge at Pascagoula. C. D. Smith & Co., Memphis, Tenn., are contractors.

PITTSBURGH, PA.—The Allegheny County Commissioners are preparing to spend between \$60,000 and \$70,000 this spring on building and repairing bridges.

We are told that the plans for the Lincoln avenue bridge, which carries Lincoln avenue over Beachwood boulevard, have been prepared for some time, but nothing has been done as yet towards letting the work. The new bridge will have an arch of 310 ft. which will be of spandrel brace type with three hinges. The width will be 50 ft., center to center of railings, of which 30 ft. will be roadway, the total length being 472 ft. The estimated cost is \$165,000. John Brunner, Bureau of Engineering and Construction.

PLATTSBURGH, N.Y.—The Burlington & Missouri River R. R. in Nebraska proposes to lower its bridge over the Missouri River at Plattsburgh by 20 ft. The bridge was built in 1882 and has a clearance of 80 ft.

QUEENSBURY, N. Y.—The Governor has signed a bill appropriating \$6,000 for a new bridge over the Glens Falls feeder at this place, Warren County.

RICHMOND, IND.—We are informed that bids are wanted, May 11, by Alex. S. Reid, County Auditor, for an iron bridge 150 ft. long over Noland's Fork. Estimated cost, \$4,000.

ROME, N. Y.—The East Dominick street bridge over Black River Canal has been condemned, as has also the South James street bridge over the Erie Canal. The Engineer of the Board of Railroad Commissioners will make plans for a new structure.

SAGINAW, MICH.—Plans, according to report, are finished for the bridge proposed over Saginaw River at Genesee street. The total length will be 720 ft., including a bascule draw of 90 ft. opening, the estimated cost being \$150,000. H. E. Terry, City Engineer.

SAN FRANCISCO, CAL.—The Board of Public Works has recommended that provision be made in the tax levy for improvements to the amount of \$286,000, part of which will be used for bridges.

SAN MATEO, CAL.—A vote will soon be taken on the proposition of issuing bonds to build two concrete bridges and one steel girder bridge; also a wooden bridge. The total cost will be about \$25,000. D. Bromfield, City Engineer.

WARASH, IND.—Bids are wanted, according to report, May 8, for two steel bridges, one 40 ft. long and 16 ft. wide, and the other 25 ft. long and 14 ft. wide; also two stone arches. W. Y. Chamberlain, County Engineer.

WHEELING, W. VA.—The Commissioners of Brooke County propose to build a steel bridge over Buffalo Creek at Waugh's Tunnel, to replace the present wooden structure.

WILLIAMSPORT, MD.—Plans are reported being made for the bridge proposed over the Potomac River between Washington County, Md., and Berkeley County, W. Va. (Construction Supplement, March 8, 1901.)

YORKSHIRE, ENGLAND.—The Lancashire & Yorkshire Ry. proposes to improve and extend its line and bridges at an estimated cost of about \$4,400,000. W. B. Worthington, Chief Engineer.

Other Structures.

BINGHAMTON, N. Y.—A new freight station will be built in this city by the Delaware & Hudson on Chenango street at a cost of about \$15,000.

BOSTON, MASS.—Fire destroyed the long freight shed of the Fitchburg Division of the B. & M. on April 28.

BRISTOL, TENN.—Report says that negotiations are in progress between the Norfolk & Western and the Southern Ry. regarding a new union passenger depot at Bristol.

CHARLESTON, W. VA.—The Kanawha & Michigan (Ohio Central Lines) will build a new passenger station, enlarge its freight yards, repair its shops and otherwise improve its property in this city.

CHICAGO, ILL.—The Crane Co. is considering plans for a large malleable iron foundry at Twelfth and Judd streets; also a large office building, improvements to cost about \$350,000.

CHICAGO, ILL.—Crane Co., Chicago, makers of valves, fittings, etc., has decided to build this summer a modern fire-proof building exclusively for offices. It will be about 90 ft. x 100 ft., five stories and basement, and will be located in the vicinity of the company's large cast-iron and malleable fitting and valve works, at Canal and Twelfth streets.

DES MOINES, IOWA.—Frost & Granger, Architects, 184 LaSalle street, Chicago, inform us that they are receiving estimates on two different methods for a passenger station for the Chicago & Northwestern, in Des Moines.

HARRISBURG, PA.—The Pennsylvania R. R. has bought the Philadelphia & Reading passenger station on Market street and will remove it. The Pennsylvania has let a contract for building the subway at this place to John Goll & Co., of Philadelphia, and will pay the cost of the whole work. The Philadelphia & Reading has plans for a freight and passenger station on Tenth street below Market.

KANSAS CITY, MO.—The Chicago, Rock Island & Pacific will build a freight depot between Twelfth and Fourteenth streets, on Wyoming avenue north of the present depot. It will be 350 x 50 ft.

LATROBE, PA.—The Dorothy coal and coke plant of the American Steel & Wire Co., has been destroyed by fire, causing a loss of about \$150,000.

MEMPHIS, TENN.—The Choctaw Mill & Elevator Co., H. C. Bradford, President, proposes to build a large grain elevator in Memphis at once, at a cost of about \$25,000.

NEW YORK, N. Y.—Fire during the night of April 29 destroyed the brick car barn of the Brooklyn Rapid Transit Co. in Flushing avenue, between Marcy and Nostrand avenues. The loss is estimated at \$60,000 exclusive of the damage to cars. The company recently lost its Flatbush avenue car barns and, according to report, plans are now under consideration for a steel shed further out on Flatbush avenue.

NORTH BALTIMORE, OHIO.—The Cincinnati, Hamilton & Dayton proposes to build a new depot on Broadway.

ORANGE, N. J.—The Lackawanna R. R. proposes to make a number of changes through this section, abandoning a station and build some new stations.

ROSELLE, N. J.—The Central R. R. of New Jersey will build a new station at this place and a tunnel beneath the tracks at a cost of \$25,000. A station and tunnel has recently been finished at Plainfield and another at Elizabeth. Similar work will be done at other stations.

ST. PAUL, MINN.—The St. Paul Union Depot Co. will increase its capital stock to \$750,000 for the purpose of enlarging the facilities at its union station in St. Paul.

TOPEKA, KAN.—The Atchison, Topeka & Santa Fe proposes to spend about \$933,800 on buildings in 1901.

WASHINGTON, D. C.—Plans have been completed for a new steel building at the headquarters of the Marine Corps, to cost about \$50,000.

The plans for a new building for the Department of Agriculture to cost \$2,000,000 have been completed. It will be of steel and white marble, four stories high, 400 ft. front, with wings 200 ft. long. Congress will be asked next winter to appropriate money for the west wing and to authorize the front structure.

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad associations and engineering societies see advertising page viii.)

Southern & Southwestern Railway Club.

At the April meeting of the Southern & Southwestern Railway Club, held in Atlanta, it was decided to establish a club scholarship of the value of \$200 at the Georgia School of Technology for the benefit of the sons of members. At this meeting the following subjects were discussed: Economical Speed for Freight Trains; Most Promising Direction in Which to Effect a Reduction in Locomotive Coal Consumption; Pooling of Locomotives; Terminal Cleaning of Passenger Cars and Is It Advisable to Have Oil in Cleaning Mixtures; Selection and Displacing of Train and Enginemen. The club will hold its next meeting in Atlanta on Thursday, Aug. 15.

American Street Railway Association.

The convention of the American Street Railway Association will be held in New York City on Oct. 9, 10 and 11. President Vreeland, of the Metropolitan Street Ry., New York, is Chairman of the General Committee. The Exhibit Committee has for its Chairman Milton G. Starr, Chief Engineer of the Metropolitan Street Ry., 621 Broadway, New York. Clinton L. Rossiter, formerly of the Brooklyn Rapid Transit, is Chairman of the Entertainment Committee. James H. McGraw, of the Street Railway Journal, 120 Liberty street, New York, is Chairman of the Transportation Committee. Col. T. S. Williams, 168 Montague street, Brooklyn, is Chairman of the Reception Committee. It is said that Madison Square Garden, which seats 30,000, will be secured for the convention. T. C. Pennington, 2020 State street, Chicago, is Secretary of the Association.

American Society of Civil Engineers.

Wednesday, May 1, 8:30 p. m.—A business meeting will be held, at which a paper by Abel E. Blackmar, Esq., entitled, "Railroad Discrimination Against New York, and the Remedy," will be presented for discussion. This paper is printed in the April *Proceedings*.

Wednesday, May 17, 8:30 p. m.—At this meeting a paper by William W. Harts, M. Am., Soc. C. E., entitled, "Description of Coos Bay, Ore., and the Improvement of its Entrance by the Government," will be presented for discussion. This paper is printed in the April *Proceedings*.

Wednesday, June 5, 8:30 p. m.—A business meeting will be held, at which a paper by Morris Knowles, Assoc. M. Am. Soc. C. E., and Mr. Charles G. Hyde, entitled, "The Lawrence, Mass., City Filter: A History of its Installation and Maintenance," will be presented for discussion. This paper is printed in the April *Proceedings*.

Texas Railway Club.

Rockport, Texas, has been selected as the next meeting place of the Texas Railway Club which will be held on Sept. 17 and 18. At the meeting held on April 16 three papers were read as follows: "Recent Advances in the Heating of Railroad Passenger Equipment," by W. P. Cosper, of Chicago, representing the Consolidated Car Heating Co.; "Electric Heating," by S. R. Tuggle, of Houston, Superintendent of Motive Power of the Houston & Texas Central; "Technical Education for Railroad Employees," by E. B. Cushing, of Houston, General Superintendent of the Houston East & West Texas R. R.

The following subjects are selected to be read at the Rockport meeting in September: "Steel Locomotive Frames as Compared with Wrought Iron," by R. M. Galbraith, of Pine Bluff, Ark.; "The Best Method for Maintaining Equipment on Texas Railroads to Meet the Requirements of Light and Heavy Traffic," A. S. Grant, Master Mechanic of the Houston East & West Texas; "Crude Petroleum as Fuel for Locomotives," J. W. Addis, of Marshall, Tex., Superintendent Motive Power, Machinery and Rolling Stock, Texas & Pacific; "Application of Handholds, Stirrups and Other Safety Appliances," George W. Butcher, of San Antonio, Superintendent of Motive Power and Machinery, San Antonio & Aransas Pass R. R.

The Engineers' Club of Philadelphia.

A regular meeting of the Club will be held on Saturday, May 4, at 8 p. m. The paper is "Notes on the Design and Maintenance of Highway Bridges," "Notes on Pile Driving," illustrated, by Harrison Souder.

At the regular meeting on April 20 Mr. I. Wendell Hubbard presented the first paper of the evening on "Notes on the Construction of a Factory Chimney." He described the construction of a chimney at Camden, N. J., for boilers of 2,000 h. p. It is 218 ft. high, built of perforated radial brick above the concrete base and flue opening, and cost \$12,250. The method of excavating for and constructing the foundations, and the design and construction of all parts of the chimney, were fully described and illustrated by lantern slides.

The second paper of the evening on the "Design and Construction of Factory Chimneys," was presented by Mr. Francis Schumann, who confined his discussion to the theory and practical designing of brick chimneys. The methods of construction and resulting stability under pressure due to weight, wind, etc., were fully considered, and several formulas were given for making the necessary calculations. The paper was illustrated by drawings and views projected by the electric lantern. A general discussion upon the subject of chimneys and the production of draught by this and other means was participated in by Messrs. D. D. Elder, R. W. Polk, Frank Sweeney, John C. Trautwine, Jr., James Christie, Henry I. Snell and others.

PERSONAL.

(For other personal mention see Elections and Appointments.)

—Mr. H. M. Abbott, Secretary and Treasurer of the Atlanta & West Point, at Atlanta, Ga., died April 26.

—Mr. C. H. Ackert, the new General Manager of the Mobile & Ohio, was born Feb. 19, 1856, and entered railroad service as an operator on the St. Louis, Kansas City & Northern in 1873. From 1877 to 1882 he was chief clerk to the General Superintendent, then for five years (1888-1893) was General Manager of the Iowa Central and later became General Manager of the Elgin, Joliet & Eastern, finally becoming President and General Manager of the latter company and the Chicago, Lake Shore & Eastern.

—Mr. James Douglas Reid, known as "The Father of the Telegraph," died April 28, at his home in New York City. Mr. Reid was born in Edinburgh, Scotland, in 1819 and came to America in 1834. He assisted in the organization of the Atlantic & Ohio Telegraph Company in 1845 and was at one time Superintendent of the Magnetic Telegraph Company, a line extending from New York to Washington. He was also connected with the Western Union Telegraph Company. Mr. Reid was appointed United States consul to Dunfermline, Scotland, in 1889.

—Mr. A. Donaldson has resigned his office as Treasurer of the Erie Railroad Company and will hereafter give his time to the less exacting, and to him more agreeable, work of expert accounting. Mr. Donaldson's early railroad education was in the pay and accounting departments of the Ohio & Mississippi Railroad, and he was Auditor of that company when he resigned in 1884 to enter the Erie service with Mr. King. As he now leaves the Erie he is, strange to say, the oldest general officer, in time of service, in that company. Mr. Donaldson is an experienced and expert accountant in the larger and fuller sense of the words.

—Mr. Theodosius F. Secor died on Monday of this week in Brooklyn, N. Y., in his 93d year. He was one of the early builders of marine engines, and in association with Commodore Vanderbilt, was a pioneer in the development of the building of steamers in this country. As a lad he was apprenticed to the Allaire Iron Works, builders of marine engines. Shortly after he ended his apprenticeship he started business with Mr. Charles Morgan, which developed later into the Morgan Iron Works and the Morgan line of steamships. After Mr. Secor separated in business from Mr. Morgan he became a partner with Commodore Vanderbilt in the Allaire Iron Works, from which Mr. Vanderbilt retired in 1862 and Mr. Secor in 1868.

—Brigadier General John M. Wilson, Chief of Engineers, U. S. Army, was retired on May 1 at his own request, in order that Col. Henry M. Robert, the senior member of the corps, might be promoted to be Chief of Engineers, and retire with the rank of Brigadier General on May 2, when he retires for age. On the retirement of Gen. Robert, Col. John M. Barlow, the second ranking Colonel of Engineers, was appointed Chief of Engineers, and at once placed upon the retired list at his own request. These retirements made Col. Peter C. Hains the ranking officer in the corps, and he will doubtless be made a Brigadier General before his retirement in 1904. On the retirement of Generals Wilson, Robert and Barlow, Col. George L. Gillespie, who has also been appointed Chief of Engineers (and Brigadier General), will assume the duties of that office, taking charge on Monday, May 6.

—Mr. Edward B. Cushing, recently appointed Engineer of Maintenance of Way of the Atlantic System of the Southern Pacific Company, was born at Houston, Tex., Nov. 22, 1862, and was educated at the Texas Military Institute and the Agricultural and Mechanical College of Texas. He entered railroad service as an axman in an engineer corps on the Galveston, Harrisburg & San Antonio in 1879. In 1881 he became transitman and Assistant Division Engineer on the Mexican & Pacific extension. In April, 1883, Mr. Cushing was appointed Assistant Engineer, track department, on the Galveston, Harrisburg & San Antonio and was afterwards, successively Assistant Division Engineer, Division Engineer and Engineer of Construction. In 1889 he became Resident Engineer of the Southern Pacific, and in 1897 General Superintendent and Chief Engineer of the Houston East & West Texas.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—The reports that E. H. Coapman had been appointed Superintendent of Terminals are incorrect. Mr. Coapman was appointed Trainmaster of the Arizona Division at Needles, Cal.

Canadian Pacific.—William Whyte has been appointed Assistant to the President, at Winnipeg. Thomas Tait becomes Manager of Transportation for all lines at Montreal. The positions of Manager of Eastern and Western Lines, held by Mr. Tait and Mr. Whyte, respectively, will be abolished. After May 1 the C. P. will be operated in six general divisions, as follows: The Atlantic Division: Lines east of Megantic; James Osborne, General Superintendent, at St. John, N. B. Eastern Division: Main lines between Megantic, Newport, Quebec, Smiths Falls and Chalk River inclusive, and all branch lines connecting therewith; C. W. Spencer, General Superintendent, at Montreal. Ontario Division: Main lines west of Smiths Falls to Windsor and Owen Sound, and all branch lines connecting therewith, and Detroit and Windsor car ferry service; H. P. Timmerman, General Superintendent, at Toronto. Lake Superior Division: Main lines between Chalk River and Port Arthur, and all branch lines connecting therewith. T. Williams, General Superintendent, at North Bay. Western Division: Main lines from Port Arthur to Laggan and Kootenay Landing inclusive, and all branch lines connecting therewith; J. W. Leonard, General Superintendent, at Winnipeg; and the Pacific Division: All railroad and steamboat lines west of Kootenay Landing and Laggan to Vancouver and New Westminster inclusive.

Chicago Great Western.—H. T. Herr, formerly Mechanical Engineer, has been appointed Division Master Mechanic, with headquarters at St. Paul, Minn., succeeding J. M. Robb, resigned. (See Virginia & Southwestern.)

Chicago, Lake Shore & Eastern.—A. F. Banks, heretofore Traffic Manager, has been elected President, succeeding C. H. Ackert.

Chicago, Rock Island & Pacific.—W. H. Stillwell, heretofore Superintendent of the Lines West of the Missouri

River, has been appointed Superintendent of the Lines East of the Missouri River, with headquarters at Davenport. C. H. Hubbell, heretofore Superintendent of the Chicago Terminals, will succeed Mr. Stillwell as Superintendent of the Lines West of the Missouri River, at Topeka, effective May 1. W. S. Tinsman succeeds Mr. Hubbell.

Delaware, Lackawanna & Western.—M. B. Casey has been appointed Superintendent of Car Service, effective May 1.

Denver & Rio Grande.—G. J. Gould has been elected Chairman of the Board, succeeding the late G. Coppel.

Erie.—The jurisdiction of George T. Slade, Superintendent of the Wyoming Division, has been extended over the Jefferson Division, succeeding F. N. Hibbits, resigned. (See Union Pacific.)

Eureka Springs.—J. B. Skelton has been appointed Superintendent of Bridges.

Illinois Central.—David Sloan has been appointed Chief Engineer of Construction, with headquarters at Chicago, reporting to the Assistant General Manager. W. J. Harahan succeeds Mr. Sloan as Chief Engineer of this company and the Yazoo & Mississippi Valley. H. W. Parkhurst, heretofore Chief of Construction, has been appointed Engineer of Bridges and Buildings of the I. C., at Chicago, effective May 1.

Kansas City Southern.—M. L. Scovell, Assistant General Freight Agent, with headquarters at Texarkana, Texas, has resigned.

Mexican International.—After May 1, the New York offices of this company will be at 25 Broad street.

Mexican National.—B. F. Dickson has been appointed Assistant General Superintendent, with headquarters at Mexico, Mex.

New York, Susquehanna & Western (Erie).—The officers of this company are: E. B. Thomas, Chairman of the Board; F. D. Underwood, President; G. M. Cumming, First Vice-President; J. A. Middleton, Second Vice-President; J. W. Platten, Treasurer; and L. D. Smith, Assistant Secretary. These gentlemen all hold similar positions on the Erie.

North & South.—The officers of this company, referred to in the Construction column, are: President, Elwood Furnas; Vice-President, S. V. Wardall; General Manager, S. M. Hauley; Secretary, E. M. Wardall; Treasurer, H. V. Brandeburg; Chief Engineer, E. C. Hollidge. The main office is Nevada, Iowa.

Riverside & Harlem.—The officers of this company recently referred to in the Construction column (April 19, p. 276), are: President, Franklin Fairman; Vice-President, Lewis T. Moore; Treasurer, J. F. Titus; Secretary, W. G. Bruen. The Illinois Central is interested.

St. Louis Southwestern.—W. L. Harrison has been appointed Superintendent of Shops, with headquarters at Pine Bluff, Ark., effective May 1.

St. Louis & San Francisco.—C. D. Purdon has been appointed Chief Engineer, succeeding F. W. Bond, resigned, effective May 1.

San Pedro, Los Angeles & Salt Lake.—T. F. Miller has been appointed Secretary; F. K. Rule, Auditor; H. S. McKee, Treasurer; T. C. Peck, Assistant General Passenger Agent; F. E. Davison, Superintendent of Machinery; and E. M. Jessup, Superintendent.

Seaboard Air Line.—W. E. Christian, heretofore General Agent of the passenger department at Portsmouth, Va., has been appointed Assistant General Passenger Agent at Atlanta, Ga., succeeding R. H. Tate, resigned, effective April 30.

Southern Pacific.—A. Millar, Secretary and Assistant Comptroller of the Union Pacific, has been elected Secretary of the S. P., also succeeding I. E. Gates.

Union Pacific.—F. N. Hibbits, heretofore Division Superintendent of the Erie at Carbondale, Pa., has been appointed Mechanical Engineer of the U. P., with headquarters at Omaha, Neb., effective May 1.

Virginia & Southwestern.—J. L. Brass, heretofore Assistant to the Vice-President and General Manager, has been appointed General Manager. J. M. Robb, heretofore Division Master Mechanic of the Chicago Great Western, is to become Master Mechanic of the V. & S. W.

Wellington & Powellville.—Horton Corwin, Jr., has been elected President, succeeding the late J. W. Branning.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

ARIZONA ROADS.—F. L. Henderson, of Los Angeles, Cal., is reported having surveys made for a railroad from mines at Quartzette, Ariz., to a mill, 14 miles.

ARKANSAS WESTERN.—A. Williams is reported to have the contract for building between Waldron, Ark., and Heavener, Ind. T., 31½ miles, on this line from Hot Springs, Ark., via Waldron and Heavener to Wister Junction, Ind. T., 120 miles. C. C. Godman, of Fort Smith, Ark., is President, and L. C. Torrence, Waldron, Chief Engineer. (Construction Supplement, March 8, 1901.)

BIRMINGHAM BELT.—This company is building an extension to Brock's Gap, Ala., four miles.

BUFFALO, ROCHESTER & PITTSBURGH.—The company is reported preparing to extend its line from Valer, Ind., to coal lands of the Rochester & Pittsburgh Coal Co.

CADIZ.—Building was begun, according to report, on April 23, on this line recently incorporated in Kentucky, to run from Cadiz to Hopkinsville, about 10 miles. W. C. White is President; D. L. Grinter, Vice-President, both of Cadiz, Ky. V. Armitage, of Philadelphia, is General Manager. (March 22, p. 209.)

CANTON-ARON TRACTION.—This company is making arrangements to connect the two cities named with an electric line. R. S. Blinn, of the Folwell Bldg., Canton, Ohio, is Engineer.

CHATHAM & LEBANON VALLEY.—The proposition is under consideration to convert a portion of this road to an electric line and build extension so as to extend the electric portion from Albany, N. Y., to Pittsfield, Mass. Extensions are proposed from Lebanon, N. Y., east nine miles to Pittsfield, Mass.; from Brainerd, N. Y., eight

miles west to Lebanon Springs, to run north 10 miles to Averill Park, terminus of the Troy & New England Electric, which runs into Troy; from Averill Park west 10 miles to Bath, where a new bridge is to be built across the Hudson into Albany. At Bath connection will be made with the Union Traction Company's lines into Rensselaer.

CHICAGO & NORTHWESTERN.—Winston Bros., of Minneapolis, Minn., are rebuilding the Chicago, St. Paul, Minneapolis & Omaha line from North Wisconsin Junction to Lake Superior. (March 29, p. 230.)

CHICAGO, DUBUQUE & PACIFIC.—The organization of this company was completed in Iowa April 23. The company, incorporated with a capital of \$200,000, proposes to build from Dubuque, Iowa, southwest through Toledo to some point in the State to be hereafter determined. The directors and incorporators are: G. R. Struble and H. J. Stiger, of Toledo, Iowa; E. W. Griffiths, of Cedar Rapids, Iowa; C. H. Meyer, James A. Hays, Henry Kiene and John Flynn, of Dubuque, Iowa. (April 12, p. 259.)

CHICAGO GREAT WESTERN.—Contracts are to be let at once, according to report, for the extension from Hampton, Iowa, west about 27 miles to Clarion. (April 5, p. 245.)

CHICAGO, MILWAUKEE & ST. PAUL.—McIntosh Bros., of Milwaukee, Wis., have been awarded the contract for straightening the track and reducing grades on the Council Bluffs Division between Cedar Rapids, Iowa, and Manilla. The grade will be reduced to 35 ft. per mile. Building was to be begun this week.

CINCINNATI, DAYTON & MAYSVILLE ELECTRIC.—This company proposes to build about 100 miles of electric line from a point on the Ohio River opposite Maysville, Ky., and running through Morrow and other towns in Ohio. S. Woodward, of Morrow, is a director.

CITIZENS' ELECTRIC STREET.—Building is reported in progress on an extension of this line from Mansfield, Ohio, northwest 10 miles to Shelby.

CLEVELAND, ASHLAND & MANSFIELD TRACTION.—Right of way is reported being secured through Ashland County, Ohio, for this proposed electric line from Mansfield northeast through Ashland and Savannah. The company has to enter Mansfield over the tracks of the Citizens' Electric.

COLONIAL.—This electric line, referred to last week under the Delaware Valley (p. 292), is to run from Stroudsburg, Pa., northeast about 13 miles through Shoemaker's to Bushkill. Surveys are made and building is begun under M. P. McGraph, of Easton, Pa., contractor. Three miles of grade is completed. The grade is not over 2 per cent., and there are a very few slight curves. Six bridges will be required. T. A. Allen, Indian Queen Hotel, Stroudsburg, Pa., is Engineer. (Official.)

DAYTON, SPRINGFIELD & URBANA.—The Bellefontaine (Ohio) City Council has granted a franchise for the Urbana, Bellefontaine & Northern branch from Urbana north to Bellefontaine.

DENVER & SOUTHWESTERN.—Contracts are reported let for building a spur from the Victor branch to the Golden Cycle on Battle Mountain, Colo.

DETROIT & TOLEDO SHORE LINE.—W. B. Strang, Jr., of No. 15 Wall street, New York, has closed a contract with the Everett-Moore syndicate, of Cleveland, Ohio, for completing this as a trolley line from Toledo north to Detroit. Building is to be begun at once. (April 12, p. 259.)

DOTHAN, HARTFORD & FLORIDA.—Plans are about completed for building this line from Dothan, Ala., on the Alabama Midland, to run southwest about 25 miles to Hartford, and thence 81 miles further to St. Joe, Fla. J. P. Pelham, Dothan, Fla., is President. (Construction Supplement, March 8, 1901.)

EUREKA & KLAMATH RIVER.—The City Council of Eureka has granted this company a franchise for tracks along the water front, thus disposing of a question which has been before the city for the past two or three years. (Construction Supplement, March 8, 1901.)

GEORGIA NORTHERN.—Building will be begun at once, according to report, to complete this line northwest to Albany, Ga.

HAWAIIAN ROADS.—Application has been made to the Hawaiian Senate for a charter to build a railroad connecting North and South Kuna, on the Island of Hawaii, by J. C. McChesney, W. A. Greenwell and W. C. Achi.

HOLLY RIVER & ADDISON.—Joseph Fucci, of Palmer, W. Va., has the contract, according to report, for building an extension of 34 miles. Geo. A. Hechmer, of Palmer, W. Va., is General Manager. (Construction Supplement, March 8, 1901.)

ILLINOIS & ROCK RIVER.—Arrangements are reported completed for early building of this electric line from Rockford, Ill., southwest 59 miles along the Rock River via Byron, Oregon, Grand Detour and Dixon to Sterling. G. E. Plumb, of Dixon, is President. (Construction Supplement, March 8, 1901.)

INDIANAPOLIS & LOGANSPOUT TRACTION.—Contracts are reported let to John B. McAfee, of Philadelphia, for building the electric line from Indianapolis, Ind., north toward Logansport. Geo. Marrott is President; M. A. Jordan, of Logansport, Vice-President, and R. C. Light, Secretary.

INDIANAPOLIS & MARTINSVILLE RAPID TRANSIT.—Surveys are reported in progress for this electric line from Indianapolis, Ind., southwest about 35 miles to Martinsville. Charles Finley Smith, of Indianapolis, is among the incorporators.

In connection with the above road, it is proposed to build a line from Martinsville southwest about 20 miles further to Bloomington. N. U. Hill, of Bloomington, and Chas. L. Henry, of Anderson, are interested.

IOWA CENTRAL.—The company has decided to do its own work on grade improvement and elevation this summer, as contractors cannot guarantee completing the work within the required time. According to report, among other improvements grades will be cut down east of Marshalltown, Iowa.

KANSAS CITY & ST. JOSEPH ELECTRIC.—Building is to be begun at once, according to report, by the Bray Construction Co., of Belleville, Ill., on this electric line connecting the two cities named. T. A. Gibson, New York Life Bldg., Kansas City, Mo., is President, and Chas. E. Gibson, Vice-President.

LARAMIE, HAIN'S PEAK & PACIFIC.—Surveys are reported in progress for this new line in Wyoming from Laramie west across the Laramie Plains to the Colorado line near Baggs. Isaac Van Horn, of Laramie, Wyo., is President. (Construction Supplement, March 8, 1901.)

MAINE CENTRAL.—Surveys are reported in progress for the proposed line from Winthrop, Me., northeast about 13 miles to Augusta. (March 15, p. 194.)

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—Surveys are reported in progress for an extension from Wishek, N. Dak., to run south to Ashley, and thence southwest through South Dakota to the Missouri River.

MOBILE & OHIO.—Surveys are reported begun for a branch from Searles, Ala., to Brookwood.

MONTICELLO, FALLSBURG & WHITE LAKE.—All the right of way has been obtained for this electric line from Fallsburg, N. Y., through Monticello to White Lake, and application will be made soon to the New York Railroad Commission. Theo. B. Dubois, of Newark, N. J., is President; John L. Sommers, of Newark, First Vice-President, and Frank X. Keiling, Secretary and Treasurer. (Construction Supplement, March 8, 1901.)

NASHVILLE, CHATTANOOGA & ST. LOUIS.—The company is reported to have decided to build its proposed branch from Pikeville, Tenn., north about 30 miles to Bon Air. (Construction Supplement, March 8, 1901.)

NEW YORK, NEW HAVEN & HARTFORD.—The stockholders of the Old Colony line have authorized the building of the connecting line from North Attleboro, Mass., northwest about eight miles to Pleasant View, on the Providence Division. (Construction Supplement, March 8, 1901.)

Surveys are reported in progress for a branch three miles long from Caanan, Conn., northeast to Clayton, just across the Massachusetts line.

NORTH & SOUTH.—Surveys are completed and contracts will be let very soon for this proposed line from Nevada, Iowa, to Des Moines. R. A. Elzy, of Marshalltown, Iowa, has a portion of the contract and six miles is completed. This was under the Duluth & New Orleans. (April 19, p. 275.) The officers are given under Elections and Appointments. (Official.)

NORTHERN PACIFIC.—Permanent location is being made, according to report, for an extension of the branch from Hoquiam, Wash., to run west along the north shore of Gray's Harbor to a point near James' Rock, thence north along the shore to the mouth of the Chehalis River. Building is to be begun within 60 days, according to report, on the extension from Scappoose, Ore., west 21 miles to Pittsburgh. (March 29, p. 230.)

OREGON RAILROAD & NAVIGATION.—Supplementary articles of incorporation have been filed in Oregon for a line from Portland to St. Johns. (Construction Supplement, March 8, 1901.)

The articles call for another line from a point near Wardner, Idaho, to the Sierra Nevada mine at the head of Deadwood Gulch; also for a third line from Fairfield, Wash., to Waverly.

OREGON SHORT LINE.—Locating surveys are nearly completed for the Salmon River extension from Blackfoot, Idaho, northwest about 85 miles to Houston, with no intermediate towns. Contracts for grading and bridging have been let to the Utah Construction Co., of Ogden, Utah. About one mile is graded and there are 200 teams at work. The work is not heavy. There will be but a small percentage in rock. The maximum grade is 40 ft. per mile; maximum curves, 3 deg. There will be about 400 ft. of iron bridge consisting of three spans crossing the Snake River near Blackfoot. (April 5, p. 246.) The line will probably be laid with second-hand 60-lb. rail, taken from the main line. (Official.)

Winters, Parsons & Broome, of Butte, Mont., are reported to have taken the contract for extensive improvements along the line between Butte and Pocatello.

PAWNEE.—This line, which runs from Pawnee, Ill., west nine miles to Auburn, is reported sold to a Chicago syndicate, and will be extended from Pawnee east about 60 miles via Taylorville to Sullivan and west about 12 miles to Waverly.

PENNSYLVANIA COMPANY.—Building is reported begun on the branch of the Western New York & Pennsylvania from near Volant, Pa., 13 miles. (Feb. 22, p. 136.)

An officer of the Grand Rapids & Indiana writes that there is no immediate prospect of building an extension from Pellston, Mich., northwest to Cross Village on Lake Michigan. (April 19, p. 276.)

The stockholders of the Cleveland, Akron & Columbus have decided to extend the Apple Creek Branch in Ohio 15 miles, and building is to be begun this month.

PITTSBURGH, BESSEMER & LAKE ERIE.—The Broadhead Contracting Co. is reported to have the contract for a cut-off at Greenville, Pa., about three miles.

RICHLAND & MAHONING.—Surveys have been completed on this line about 20 miles east of Akron, Ohio, toward Niles. The road is projected from Mansfield, Ohio, east to Wooster. See also Youngstown & Cleveland.

ROCHESTER & SOUTHERN TRACTION.—This company has been organized to build an electric line from Rochester, N. Y., south about 60 miles down the Genesee Valley via Genesee, Mount Morris, Groveland and West Sparta to Dansville. It is to have \$1,000,000 capital. Among those interested are: Dr. J. Arthur Jackson, Dansville; W. H. Gray, Groveland; James B. Frazer, West Sparta; H. E. Gore, Mount Morris; E. W. Horton, Genesee; J. M. E. O'Grady, Rochester, and Frederick St. John, New York.

SACRAMENTO & SAN JOAQUIN VALLEY.—The Atchison, Topeka & Santa Fe has offered to give right of way to this company over its tracks into Stockton, Cal., on the advance payment of 6 per cent. of one-half the cost of the terminal tracks, with one-half the cost of maintenance of the road. The new line is projected from Stockton north 50 miles via Freeport to Sacramento. John Cross, of Los Angeles, Cal., is President and Chief Engineer. (Construction Supplement, March 8, 1901.)

ST. LOUIS & SAN FRANCISCO.—Johnston Bros. & Faught, of St. Elmo, Ill., have the contract for the connecting link from Miami, Ind. T., southwest 12 miles to Afton, to connect with the Kansas City, Fort Scott & Memphis. (March 22, p. 210.)

ST. LOUIS SOUTHWESTERN.—An extension is reported under consideration from a point near Renner Station, Tex., to Dallas.

SOUTHERN.—This line, which was recently completed from Maryville, Tenn., southeast nine miles to Gamble's Store, is to be extended, according to report, about three miles more. Surveys are in progress. (Construction Supplement, March 8, 1901.)

SOUTHERN OHIO TRACTION.—This company has obtained control of the Cincinnati Northwestern, a steam

road from College Hill, Ohio, near Cincinnati to Mt. Healthy, six miles, and proposes to use it for an electric extension.

TEXAS PACIFIC.—The Grigsby Construction Co., of Kansas City, has taken the contract for the 75 miles of extension of the Natchitoches & Red River Valley northwest along the west bank of the Red River to Shreveport, La. (April 19, p. 276.)

TOLEDO & MICHIGAN TERMINAL.—This company has been incorporated, with a capital stock of \$200,000, to build a railroad from Toledo, Ohio, north about 25 miles to Monroe, Mich. The principal office is Detroit. The directors are: Frederick W. B. Coleman, Luman W. Goodenough, Alexander Munroe, Julian H. Harris and Henry L. Lyster, all of Detroit.

TOLEDO & OHIO CENTRAL.—The Kanawha & Michigan, according to report, has decided to build several miles of track to enlarge its freight yards at Charleston, W. Va.

TOLEDO & WESTERN.—Thompson & Sawyer, of Toledo, Ohio, are reported to have the contract for the Toledo, Adrian & Jackson extension between Sylvania, Ohio, and Blissfield, toward Adrian, Mich., and also from Sylvania west to Matamora on the main line. Luther Allen, of Cleveland, Ohio, is President, and J. B. Perkins, of Toledo, Electrical Engineer. (Construction Supplement, March 8, 1901.)

TROY, RENSSLAER & PITTSFIELD.—This company has been incorporated in New York, with a capital stock of \$350,000, to build an electric road 35 miles long from Troy east to the Massachusetts boundary line. The directors are: Edward F. Murray, Rice E. Ball, James W. Donnelly, Cornelius V. Collins, William H. Draper, Anthony P. Finner and Joseph C. Behan of Troy; William D. Barnes of Brainard, and Matthew A. Heeran, of Rensselaer.

WASHINGTON & OREGON.—Building is reported begun between Vancouver and Kalama, on this proposed line from Portland, Ore., north to Tacoma and Seattle. (April 12, p. 260.)

WASHINGTON STREET.—Z. F. Graham, owner of this electric line in Washington, Ind., has made a proposition to build an extension from that city east about 20 miles through the towns of Montgomery and Cannelburg to Loggotee.

WESTERN MARYLAND.—H. H. George, Jr., of Richmond, Va., is reported to have the contract for a portion of the improvements proposed on this line. (April 19, p. 276.)

WEST SIDE BELT.—Contracts will be let this week, according to report, for an extension of this belt line at Pittsburgh from Sawmill Run around the south side of the city to Wilson station. It is understood that the belt line is to be used by the new Gould road, to form part of its proposed freight terminals.

WISCONSIN CENTRAL.—A spur will be built, according to report, from Schlesingerville, Wis., to the south end of Cedar Lake, about one mile.

WISCONSIN ROADS.—The Peshtigo Lumber Co., according to report, will build a railroad 12 miles long from Bagley Junction northwest through timber lands.

WISCONSIN WESTERN.—An officer writes that decision is not yet reached as to what routes will be chosen for the extension. The line will be extended either to Wilton or Union Center, Wis., on the north, or to Lancaster or Stockton on the south. No surveys have been made. (April 19, p. 276.)

WILMINGTON CITY.—Building is reported in progress on an extension of this electric line west from Wilmington, Del., to Marshalltown, Stanton and Newport.

YOUNGSTOWN & CLEVELAND.—Articles of incorporation were filed in Ohio, April 24, for the Youngstown & Chagrin Falls and the Chagrin Falls & Cleveland, to be merged into the Youngstown & Cleveland, and to build a double-track road connecting those two cities. C. W. French and C. D. Crouch, of Mansfield, Ohio, who are projectors of the Richland & Mahoning, are incorporators.

GENERAL RAILROAD NEWS.

CALVERT, WACO & BRAZOS VALLEY.—The Governor of Texas has signed the bill authorizing the International & Great Northern to buy and operate this property on condition that it be extended to Fort Worth and south to Spring, Texas, near Houston, by March 1, 1905. (Feb. 15, p. 120.)

CANADIAN PACIFIC.—Five per cent. land grant bonds of 1881, to the par value of \$100,000, have been drawn for redemption at 110 and interest, at the office of the company's Treasurer in Montreal, interest to cease June 21.

CHAGRIN FALLS & EASTERN ELECTRIC.—E. G. Tillotson has bought an interest in this electric line in behalf of a Cleveland syndicate which already has large holdings in the Cleveland & Eastern Electric and a controlling interest in the Cleveland & Chagrin Falls Electric. The ultimate intention is, according to report, to consolidate all three properties.

CHICAGO, BURLINGTON & QUINCY.—Francis W. Hunnewell, Chairman of the Board, on April 25, made the following statement to the stockholders with reference to the proposed sale of this property:

A proposition has been received by your directors for the purchase of all, or any part not less than two-thirds, of the outstanding capital stock at \$200 per share, payable in joint four (4) per cent. bonds of the Great Northern and the Northern Pacific Railway Companies, with the option to stockholders to receive part of the payment in cash if they so desire. Full particulars of the proposition will be mailed to the stockholders in a few days. (April 19, p. 276.)

A circular has been issued to subscribers formally announcing the plan for the control of the property by the Great Northern and the Northern Pacific. J. P. Morgan & Co. have formed a syndicate to provide \$50,000,000 for such Burlington holders as wish part payment in cash. The offer is for all or any part of the stock not less than two-thirds. Stockholders are given the option of receiving \$200 in 4 per cent. bonds, or \$160 in bonds and \$40 in cash, or if there is sufficient cash, they may receive the entire \$200 in money. The bonds to be issued will be a joint obligation of the Great Northern and the Northern Pacific, and will bear interest from July 1 next, maturing in 20 years, but redeemable at the option of the purchasing companies at 105 and accrued interest, on or after July 1, 1906. They are to be coupon bonds of \$1,000 denomination, and

registered certificates of the denomination of \$1,000 or of \$5,000, or of some multiple of \$5,000. Scrip for fractional amounts will be issued by the depositaries, the Metropolitan Trust Co., New York, and the Old Colony Trust Co., Boston. Francis W. Hunnewell, Chairman of the Board; Charles J. Faine and J. Malcolm Forbes, acting as a committee in the Burlington stockholders' interests, will return stock should less than two-thirds of the whole amount be deposited on or before May 20. Payments in bonds and cash will be made on Sept. 2. Holders of the convertible 5 per cent. bonds of the Burlington (amounting to about \$2,800,000) are urged to change their bonds for Burlington stock to be turned in under the terms. The Burlington stock is to receive a dividend of 2 per cent. in addition to the above payments.

CINCINNATI SOUTHERN.—President Spencer has approved of the terms of the new lease to the Southern Ry. proposed recently by the directors of the Cincinnati Southern and it is expected that the contract will be submitted to the voters of Cincinnati as soon as possible. (April 19, p. 276.)

DENVER & RIO GRANDE.—Nathaniel W. Raphael has brought action in the U. S. Circuit Court by Judge Addison Brown, of New York, and an order has been issued to restrain Spencer Trask & Co. from carrying out their plans of consolidation for the Denver & Rio Grande and the Rio Grande Western, and enjoining them from selling any of the stock to be issued as a result of the consolidation. The order was made temporary and the defendant company was to appear before Judge Brown May 1 to show reason why the order should not be made permanent. Mr. Raphael's action involves \$1,500,000 in second mortgage bonds on a branch line in Utah now controlled and operated by the two companies. (April 26, p. 292.)

FORT WAYNE, TERRE HAUTE & SOUTHWESTERN.—Logan C. Butler, Special Master of the U. S. Court, sold this property at Carbon, Ind., April 25, to Porter Skinner for \$14,000. This road was sold last year to the Chicago & Southeastern, which has had control of the property for some time. (March 23, 1900, p. 194.)

HOUSTON & TEXAS CENTRAL.—The act of the Texas Legislature will go into effect July 7 which authorizes this company to buy the Central Texas & Northwestern, the Fort Worth & New Orleans, the Lancaster Tap, the Austin & Northwestern and the Granite Mountain & Marble Falls, roads already controlled by the purchasing company. (March 15, p. 194.)

KANSAS CITY, FORT SCOTT & MEMPHIS.—The time for depositing stocks of the Current River and the Kansas City, Clinton & Springfield with the Old Colony Trust Co. for exchange into stock of the Memphis Co. has been extended until May 1. (April 5, p. 246.)

MEXICAN NORTHERN.—The Morton Trust Co. has at its disposal in the sinking fund \$32,523.21 and offers to buy first mortgage bonds at not to exceed 105 and accrued interest. Sealed offers will be received up to noon May 21. (Nov. 16, 1900, p. 764.)

MINNESOTA & WISCONSIN.—Negotiations are reported completed for selling this line to the Chicago, St. Paul, Minneapolis & Omaha. It extends from Spring Valley, Wis., to Emerald, 21 miles.

OREGON SHORT LINE.—The Secretary of the Interior, on April 25, decided in favor of the Utah, Nevada & California, controlled by the O. S. L., with reference to the right of way in Nevada claimed by this company and the new San Pedro, Los Angeles & Salt Lake. (April 26, p. 286.)

PITTSBURGH, FORT WAYNE & CHICAGO.—The company will pay a dividend of 2 per cent. on original guaranteed stock on July 2, to holders of record on June 8. Another dividend of 2 per cent. is payable on the guaranteed special stock July 1, to holders of record on June 15.

READING.—The additional equipment trusts announced some months ago are limited to \$3,200,000 in 4½ per cent. gold bonds. They will mature in amounts of \$200,000 semi-annually, from March 1, 1902, to Sept. 1, 1909, inclusive. As security, the Girard Trust Co., as trustee, holds \$833,000 general mortgage 4 per cent. bonds of the Reading Co., and the following new equipment: Passenger locomotives, 10; heavy freight locomotives, 38; steel, double-hopper coal cars (100,000 lbs. capacity), 1,000; steel gondola cars (100,000 lbs. capacity), 500; box cars, steel underframing (60,000 lbs. capacity), 500; passenger coaches (standard 20, vestibule 10), 30; marine equipment (1 ferryboat, 8 sea barges, 1,500 tons capacity; 2 sea barges, 3,000 tons capacity; 1 sea-going tug), 12.

ST. CLAIR, MADISON & ST. LOUIS BELT.—Ten bonds have been called for payment, with interest, at the Central Trust Co., St. Louis, on June 19. These bonds are understood to be the fraction of the loan which did not assent to the reorganization plan. (April 12, p. 260.)

SOUTHERN.—The stockholders, on April 24, ratified the action of the directors in buying the general mortgage bonds and capital stock of the Mobile & Ohio under the terms in the circular notice of Jan. 31, and have also ratified the execution of the 4 per cent. collateral trust bonds and the stock trust certificates of the Southern Ry. in payment of the same. It is expected that the distribution of the new securities will begin May 1. (M. & O., March 1, p. 152.)

TACOMA EASTERN.—Attempts are being made, according to report, by the Northern Pacific to induce this company to discontinue building a parallel line. The line, as projected, is from Tacoma, Wash., south 52 miles via Lake Kijousin, Eatonsville and Elbe to Ashford. (Construction Supplement, March 8, 1901.)

TOLEDO, BOWLING GREEN & SOUTHERN TRACTION.—The company, recently entered in these columns under the title of the Toledo & Southern Inter-Urban, is reported to have bought this electric line for a portion of its proposed road from Toledo, Ohio, south through Findlay, with the ultimate intention of reaching Dayton and Cincinnati. George B. Kerper, General Manager of the People's Street Ry., of Dayton, Ohio, and President of the Findlay Street Ry., is President of the new company. (Construction column, April 12, p. 260.)

TROY & NEW ENGLAND.—The majority stockholders are reported to have signed an agreement to sell their stock to a company which proposes to use this electric line to connect Pittsfield, Mass., with Troy and Albany. The line is 8.9 miles long.

WABASH.—Simon Borg & Co., and F. J. Lisman & Co. are offering at 104 and interest, the \$3,000,000 equipment and sinking fund 5 per cent. gold bonds of 1901, recently authorized. (March 22, p. 210.)